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Editorial Notes

The Crisis and Brighton

IN their time, we have heard the British Commercial Gas Association abused for many things. Like all pioneers, they have naturally made their mistakes in the course of their progress into the previously unexplored field of co-operative advertising. More often, in our view, dissatisfaction has been due to the parochialism of the Gas Industry which has always been such an obstacle to standardization of any kind, or to the inability of certain units to grasp the real meaning and requirements of advertising in its modern state of development. Be that as it may, the point we would make is that the Association must at least be absolved from any blame for the crisis in world affairs which was reached last week after a period of tension which had not been equalled in post-war days. The Industry can therefore only commiserate with itself that certain plans which the Association had well laid have suffered a check, as did many other intended enterprises in recent weeks.

We believe that the annual conferences which the B.C.G.A. arranges are among the best value in the "gas" year, in that they bring together a diversity of interests for the discussion of common ideals in usually congenial surroundings—and Brighton would certainly have satisfied the latter condition. We know, too, that exceptionally good material was available for this year's gathering, and the Industry's loss is the greater for that reason. Our sympathy is extended to those who had worked so hard to complete the organization—the B.C.G.A. staff, the Brighton Company, and the several firms who had arranged visits to their works. In the lighter mood which is upon us all to-day—we can only hope that it will be more than temporary—we would chide the nations for such gross mistiming of their crises, and particularly for the fact that, had we known the settlement date only a few days earlier, we could still have celebrated the relaxation of tension by discussing our next business plans in the agreeable breezes of the South Coast.

Smoke and YOU

AMONG the foremost will, we hope, be the Industry's tie-up with the smoke abatement campaign to which we referred in some detail a fortnight ago. Since then it had appeared likely to be born into a world unhealthy for the struggling infant. To-day the Londoner in the street has changed the grim and determined look of recent weeks for a smiling expression which augurs well for business, and we believe the same feeling will have been noticeable everywhere. It may well be, indeed, that the next few months will provide as good an opportunity as has occurred in years for the launching of a big commercial campaign, so let us turn with enthusiasm and energy to the Gas Industry's part in abolishing "Britain's Burning Shame."

All of us have for long enough been piously horrified at the impurity of our atmosphere, and been duly shocked at the frequent reiteration of the grim toll which it levies on health and wealth. But, quite frankly, what has the average individual done about it? Has not the attitude been that it ought really to be taken seriously in hand, but that it is somebody else's job to see about it? Whereas, then, smoke abatement in the abstract has undoubtedly impressed itself upon the nation's consciousness in recent years, "Britain's Burning Shame," the National Smoke Abatement Society's booklet, is the first real attempt to bring home to the citizen what he or she can do as an individual to remedy a disgraceful state of affairs.

This crystallization of the problem seems to us to give new hope to a cause which, however great, has always appeared to be struggling against tremendous odds. It tackles the problem from a fresh angle by reducing it from the general to the particular, by pointing out how the individual citizen is personally affected, and what is his or her responsibility in the matter. Where the Gas Industry can come in is in pointing out remedies for the state of affairs which are available to every home. The B.C.G.A. has given a lead with a companion brochure to the Smoke Abatement Society's which tells "what *you* can do to get rid of smoke." This is only a beginning, and we do feel that the campaign, when the time comes to launch it into full swing, will offer unlimited scope for every individual gas undertaking. What form the thrust is to take will depend mainly upon local conditions, but it is quite certain that the Gas Industry, to its own advantage, can help the national cause of smoke abatement, since no other industry is so well equipped to offer substitutes for apparatus which consume coal in a crude and dirt-producing manner.

Anti-Smoke, not Coal

OBJECTION to the campaign has been made to us in one or two instances on the ground that it constitutes an attack on the coal distributing trade, through which much of the gas coke output is handled. While we always hesitate in our columns to criticize the views, on matters of this kind, of individual executives who know so much more of local conditions than we do, this attitude does seem to us somewhat weak-kneed. Of course the campaign is directed against the burning of raw coal in such manner as to produce clouds of smoke; progress of all future sales campaigns will be very slow if we are compelled to regard this point as a delicate one, because it is rather rude to our friends who market our coke. But the view expressed appears to disregard two important factors. One is that the smoke abatement campaign makes strong recommendation of the substitution of coal by coke, and not by gas in all circumstances. Secondly, the coal factors do not handle coke for the mere fun of doing so, but because a steadily growing demand for it makes it an essential part of their business. While the present campaign is quite decidedly not intended as an attack on coal as such, we hardly think the distributing trade, even if it were, would go so far as to cut off its coke nose just to spite its coal face.

Public Lighting

WE have already called attention to the main points made in the Papers of direct interest to the Gas Industry presented at the Conference of the Association of Public Lighting Engineers last month. It will be generally agreed that the Conference was a great success and that the discussions on the Papers were excellent; they certainly gave rise to many thoughts concerning the future of gas in the sphere of public lighting and demonstrated that without doubt this future may be regarded without any qualms. Gas lighting equipment has been improved beyond recognition in recent years, and in the past two years added impetus to development has been given by the activities of the Society of British Gas Industries; it remains to apply these scientific developments, and there are men in the Gas Industry technically equipped to obtain the best results from the efficient modern appliances available. We would add that the manufacturers of these appliances are ever willing to extend their help in this direction.

Good lighting, whether by gas or electricity, costs money; and this all-important question of finance was once again brought up at the Conference. Whether the A.P.L.E. provides the most appropriate platform for discussion of the matter, for urging the Home Office or the Ministry of Transport to make grants to poor local authorities, is a moot point; the fact remains, however, that, without such grants many local authorities cannot be expected to light their streets in conformity with the recommendations of the Ministry of Transport. At the Conference the case was cited of one small local authority where a penny rate brings in only £30 a year and where there are five miles of road to administer. Practically all the traffic using the roads is "through" traffic. In his Conference Paper, which we published in full in the "JOURNAL," Mr. W. Hodkinson, of the United Gas Corporation, Ltd., quoted the case of a small urban district council in whose area there are no fewer than 16 miles of main traffic roads, of which 13 miles are non-scheduled. A penny rate in the area yields £55 per annum. To light these 13 miles to a minimum Class A standard, capital charges alone would require an additional rate of 1s. 3d.

Now the point emphasized by Mr. Hodkinson, and we regard it as a very important one, is that where local authorities find themselves unable to adopt the recommendations of the Ministry of Transport Report they become reluctant to undertake any improvements to their lighting, preferring to reserve their spending powers in the hope that at some future date assistance will be provided to enable them to adopt the Ministry's recommendations. Yet so much could be done at small cost by experienced lighting engineers in the matter of siting, particularly at bends, cross-roads, and tee junctions, to improve existing installations, and much, too, could be accomplished if more attention was paid to the maintenance of installations. In the latter connexion we were glad to note in the discussion the tribute paid to gas by more than one councillor on the score of maintenance. Undoubtedly by far the most important factor influencing luminous output is the quality of the general maintenance work, and with reasonable maintenance gas lighting has a very low depreciation factor. It is possible safely to guarantee to maintain gas lighting installations to within 20% of their initial values. In his Paper Mr. Hodkinson gave details of several gas lighting installations erected during the past three years by the constituent undertakings of the United Kingdom Corporation and explained the facilities afforded these undertakings by expert advice and assistance from a central office. The examples he illustrated and described in his Paper ought to have done much to encourage local authorities to investigate what improvements can be effected at small cost by careful planning and modern equipment.

Importance of Siting

SEVERAL other interesting points emerged from the discussion. We have long advocated that gas undertakings should erect demonstration lighting installations so that local authorities can see for themselves what modern gas lighting means. The United Kingdom Corporation has adopted this practice. It offers to provide and erect free of charge and without obligation demonstration installations of not less than six lamps in the road or roads to be lighted; and, said Mr. Hodkinson in his Paper, "from our experience to date we are convinced that this is the only effective method of indicating to the authority concerned the results they will obtain from any particular type of installation." There is yet the task of changing the apathy of many local authorities into interest in the lighting of the districts under their control.

Mr. James Carr, of Stretford, referred to this in the discussion. During the past twelve months, he observed, there had been signs of improvement, but very often the experimental installations erected by gas undertakings for the inspection of small local authorities were not even considered. It is evident that more propaganda work is needed.

Criticism was made during the discussion that the Gas Industry is not sufficiently ambitious in regard to main street lighting schemes, that so far the Industry had been prone to erect installations which gave an output only slightly in excess of the 3,000 lumens per 100 ft. linear recommended by the Ministry of Transport for Class A roads, and one speaker suggested that it would be better to work to about 5,000 lumens per 100 ft. as a general average. The truth of the matter is that siting is more important than the mere provision of lumens. If the lumens are skilfully applied an installation can be carried out just as satisfactorily with a lower lumen output. Naturally good visibility cannot be achieved unless the quantity of light falling upon a road and other essential backgrounds exceeds a certain minimum; but it should be

borne in mind that visibility does not increase *pro rata* to luminous output. At the Conference Mr. C. I. Winstone explained that he had seen a road lighted with 6,500 lumens per 100 ft. and another with 3,500 lumens, and though he had normal eyesight he could not see that the further 3,000 lumens made any difference to visibility. Of course, it depends on the type of installation, but there must be many instances in which no good is achieved by increasing luminous output, because it does not improve visibility if there is a sufficiency in the first place and the installation is scientifically planned. The additional lumens have to be paid for. Why use 7,000 or 8,000 lumens if 4,000 lumens will fulfil the requirements satisfactorily?

Centralization of Gas Manufacture at Bradford

In January, 1936, the Bradford Corporation Gas Committee passed a resolution recommending the adoption of a scheme of centralization of gas manufacture at the Birkshall Works. Sanction was given and the extensive programme was put in hand. Wednesday last saw the official inauguration of the completed scheme, and on later pages will be found an account of the opening and a description of the new works. The ceremony was to have been performed by Lord Stamp, but owing to the international crisis he was unable to attend, and his place was taken by the Lord Mayor of Bradford, Alderman Henry Hudson. To mark the occasion a profusely illustrated brochure describing the scheme had been published, and in a foreword Sir David Milne-Watson said there could be no doubt that the rationalization of gas production at Bradford provided yet another instance of the Industry's determination to keep itself well to the front. "It shows a vision," he continued, "which, if not unique, is nevertheless a further reminder to other gas departments and gas companies of the desirability and need of reorganization to-day. . . . It takes more than the expenditure of a large sum of money, and the utilization of first-class technical brains and willing workmen, to undertake a complete reconstruction of a manufacturing plant. It shows courage and a profound belief in the future of our Industry, a belief which is largely responsible for the continuance and growth of public faith in our product. The feeling of confidence within the Industry comes over in no uncertain manner to the public, and they in their turn, are therefore subconsciously spurred on to make greater use of gas."

Chemical Research

We referred recently in these columns to the important work on corrosion being carried out at the Chemical Research Laboratory of the Department of Scientific and Industrial Research, calling attention in particular to the findings regarding the influence of carbon dioxide on the corrosion of iron and steel. Carbon dioxide has usually been considered to be an active stimulator of the atmospheric corrosion of iron, but experiments in the Laboratories have shown that this substance, at concentrations in the neighbourhood of, and also considerably higher than, the normal atmospheric content, has a marked repressive effect at ordinary temperatures. This effect has been demonstrated both for saturated and supersaturated atmospheres and both in the presence and in the absence of traces of sulphur dioxide. These conclusions are set out in the Report which has just been published of the Chemistry Research Board for the triennial period ended Dec. 31 last. The Report indicates the great scope and the wide variety of the investigations which are in hand. Much of the work described in the Report is of a long-term character, that on corrosion being an example. Other examples are the studies of high-pressure gas reactions, of coal and tar, and of the rarer metals. Another type of investigation deals with matters of more immediate industrial application and is undertaken at the request and mainly at the expense of industry itself. Regarding this type we published in the "JOURNAL" for May 25 last the results of work carried out on behalf of the Association of Tar Distillers into the causes and prevention of the corrosion of tar stills. Since the introduction of vertical retort tar the life of stills has decreased by 50%, and it was calculated that this reduction was equivalent to 5d. per ton of tar distilled and was costing the tar distillation industry something like £25,000 annually. Attention has also been directed, on behalf of the British Road Tar Association, to tars to improve their value as road materials, while the possibility of compounding rubber and tar with a view to establishing its use on the roads and for other industrial purposes is being investigated in co-operation with the rubber-growing industry.

A further very interesting piece of investigation mentioned in the Report has been into the occurrence of gallium and germanium in flue dusts, this study being made on the flue dusts supplied by many gas undertakings. It has been shown that all gas-works dusts contain both germanium and gallium, irrespective of the coal used, and flue dust is a valuable potential source of these rare metals. Sir Gilbert Morgan observed in a recent communication to the Society of Chemical Industry that "it is interesting and yet disquieting to realize that if only one hundred million tons of the coal produced annually in Great Britain is germaniferous, and if that coal contains not more than 0·002% of germanium and half that amount of gallium, then some 2,000 and 1,000 tons of these metals which might be put to some useful purpose are either being dissipated into the atmosphere or discarded as useless dust." A very large part of the work at the Chemical Laboratory at Teddington is of help and direct concern to the Gas Industry.

Personal

Retirement of Professor John W. Cobb

On Sept. 30 Professor John W. Cobb, C.B.E., retired from the Chair of Coal Gas and Fuel Industries at Leeds University, and on that day he was entertained at luncheon at the Savoy Hotel, London, by his fellow members of the Joint Research Committee of The Institution of Gas Engineers and Leeds University and of the Liquor Effluents and Ammonia Committee of the Institution. During lunch a presentation of a silver waiter, inscribed as follows, was made to Professor Cobb by Mr. Harold C. Smith, Chairman of the Joint Research Committee, on behalf of the members of the two Committees: "Presented to Professor John W. Cobb by members of the Joint Research Committee of The Institution of Gas Engineers and Leeds University and of the Liquor Effluents and Ammonia Committee of the Institution in appreciation of his long and valued collaboration. September 30th, 1938."

* * *

Mr. GEORGE BREARLEY, B.Sc., Manager of the Mersey Chemical Works, has been appointed a Director of Brotherton & Co., Ltd.

* * *

The wedding took place on Sept. 21, at St. Andrew's Church, Countesthorpe, of Miss MILLICENT WARD and Mr. REGINALD HARRY BANKS. The bride is the younger daughter of Mr. F. H. Biggin, a Director of the British Gas Purifying Materials Company, Ltd., the Narborough, Blaby, Enderby, and Whetstone Gas Light and Coke Company, Ltd., and other companies connected with public works. The bridegroom's father, Mr. H. Banks, is Chief Engineer and Manager of the Northampton Gas Light Company.

Obituary

Mr. JOHN DRUMMOND CLARK, a Director of the Corbridge Gas Company, has died at the age of ninety-one.

* * *

The death has occurred of Mr. P. J. LIDDELL, a Director of the Haltwhistle Gas Company.

Institution of Gas Engineers

Forthcoming Meetings of Interest to Members

Members of The Institution of Gas Engineers will be welcome at the undermentioned meetings of kindred associations:

A Joint Meeting with the Incorporated Association of Rating and Valuation Officers with the Institution of Chemical Engineers in the rooms of the Geological Society, Burlington House, W. 1, on Oct. 11, at 6 p.m. A Paper will be presented by Mr. P. M. Faraday on "Principles and Practice of Rating of Industrial Concerns, with Special Reference to Chemical Works."

The Melchett Lecture of the Institute of Fuel in the Meeting Hall of the Institution of Mechanical Engineers, Storey's Gate, S.W. 1, on Oct. 13, at 3 p.m. The Melchett Medallist for 1938, Professor Richard Vernon Wheeler, D.Sc., F.G.S., F.I.C., will give his Melchett Lecture entitled "Destructive Distillation."

News of the Week

The Wateringbury Gas Company give notice that as from Jan. 1 next they will supply gas of a calorific value of 475 B.Th.U. per cu.ft.

The Knottingley Gas Company give notice of their intention to supply gas at a calorific value of 500 B.Th.U. instead of 450 B.Th.U. as from Jan. 1, 1939.

Notice is Given that as and from Jan. 1, 1939, the declared calorific value of the gas supplied by the Llanelly Gaslight Company will be 450 B.Th.U. per cu.ft.

The Price of Gas has been increased by the Middlesbrough Corporation Gas Department from 1s. 9d. to 2s. 2½d. per 1,000 cu.ft. The rates for industrial consumers are being proportionately increased.

Permission Was Given To The Public to inspect the Borough Gas and Electricity Works during the week commencing Oct. 3, in celebration of the incorporation of the Borough of Loughborough.

A Secretary and Accountant is required by the Directors of the Canterbury Gas and Water Company. The position carries a commencing salary of £600 a year and further particulars will be found in our advertisement columns.

An Industrial Gas Salesman is required by the Coventry Gas Department. Further particulars of the position, which carries a commencing salary of £400, rising by increments of £20 to £500 per annum, will be found in our advertisement columns.

More Than Sixteen Million American Women have chosen gas as the ideal modern cooking fuel. The installation of modern gas ranges is going on in American homes at the rate of about 1,500,000 a year, reports the New Jersey Public Utility Information Committee.

A Very Excited Small Boy ran home during the recent crisis and told his mother that he had seen two "great big cannons" go down New Road, Peterborough, on a lorry. It appeared later that the "cannons" were two sections of a new 15 in. gas main which is being laid in the City by Peterborough Gas Company.

The Price of Gas at Lytham St. Annes was discussed at a meeting of the Town Council, when Alderman J. H. Dawson, Chairman of the Gas Committee, announced a loss of £372 on the year's working. A recommendation was approved to adopt a discount of 2½% on gas accounts, instead of 4½d. per 1,000 cu.ft. used.

Meeting in Committee on Sept. 28, the Doncaster Town Council approved a £90,000 scheme for the construction of a new gas-producing plant, to include the extension of the coal-handling plant and the installation of modern washing plant. It is hoped that it will be possible to make an early start on the scheme.

The Last Loan Approved by the Ministry of Health amounting to £16,000 and covering a period of three years has expired, and the Scunthorpe Gas Committee is to make application for a further loan of £18,000 to cover estimated requirements for three years, consisting of: Mains, £8,000; meters, £6,000; and services, £4,000.

Notice is Given, in pursuance of Section 7 of the United District Gas (Charges) Order, 1922, that the calorific value of the gas which the Company intend to supply in the Cricklade Works Supply Area as from Jan. 1, 1939, will be 475 B.Th.U. and such value shall be the declared calorific value and such date shall be the declared date within the meaning and for the purposes of the Order.

The First Gas-Filling Station for automobiles operating by gas instead of petrol has been built at Moscow. Several experimental lorries which work on gas are already plying the Moscow streets, and a new batch will shortly be turned out by the Institute of Research in Autotraction. The new gas station gets its supply direct from the Moscow Gas-Works, with which it is connected by pipe line.

An Exhibit was staged by the Bolton Gas Department at the Bolton Centenary Exhibition which opened at the Drill Hall, Bolton, on Sept. 21, and ran until Oct. 1, in connexion with the hundredth anniversary celebrations of the granting of its Charter of Incorporation as a Municipal Borough to the town. The stand included a model gas-works and latest designs in gas appliances. An interesting item was the oldest gas cooker in Bolton.

A Change of Calorific Value from 450 B.Th.U. to 475 B.Th.U. will be made by the Cirencester Gas Company as from Jan. 1 next according to an announcement in the *London Gazette*.

Cookery Demonstrations were held by the Shrewsbury Gas Light Company throughout last week. Miss M. K. Gompertz demonstrated at afternoon and evening sessions, and during the intervals visitors were able to see an exhibition of modern gas appliances at St. Mary's Hall.

The Amalgamation of the Ilkley Urban District Council Gas Department with the gas undertaking formerly vested in the Urban District Council of Burley-in-Wharfedale and for that purpose to extend the limits for the supply of gas is among the provisions of a Special Order for which the Ilkley U.D.C. intend to apply to the Board of Trade under the Gas Undertakings Acts, 1920 to 1934.

Owing to a Difficulty that has arisen in the interpretation of gas charges, the Lancaster Corporation Gas Department has decided for the future the following amplification of charges be made: For a half-quarterly consumption not exceeding 2,000 cu.ft., 22 cu.ft. of gas per 1d. or 3s. 9·45d. per 1,000 cu.ft. For a half-quarterly consumption over 2,000 cu.ft., the above rate for the first 2,000 cu.ft. and for the remainder, 33 cu.ft. of gas per 1d. or 2s. 6d. per 1,000 cu.ft. The Engineer and Manager, Mr. W. A. Dearden, reports that the plant which he anticipates will be required during the next five years is as follows: Carbonizing plant: Re-setting or inclined ovens, No. 1 installations, or the provision of a new plant at an estimated cost of £60,000; and new mains and new meters, £4,000 per annum.

A Fortnight's Industrial Gas Exhibition has recently been concluded in the Demonstration Theatre of the Ashton-under-Lyne Gas Company. The majority of space was given up to large scale cooking appliances by Radiation Ltd. Ascot Gas Water Heaters, Ltd., exhibited their hot water appliances, and Jackson Boilers several café sets. Various manufacturers of bakers' ovens and similar cooking apparatus were exhibited, and space was also devoted to hairdressers' equipment. The latter, with its permanent waving machine, hair-dryer, and sterilizing cabinet, attracted considerable attention. Fish frying demonstrations were given on the latest type of gas-fired range manufactured by A. E. & A. Robinson & Co., Ltd., and this proved very popular. The results of the Exhibition were exceedingly gratifying.

To Encourage the Use of Gas for Water Heating, the Edinburgh Corporation Gas Committee has agreed to a recommendation that sink heaters, circulating units, and multi-point heaters be offered for hire and hire-purchase to gas consumers at rentals which will prove economical. The minimum period of hire will be three years and all the installation work will be done by members of Edinburgh and District Master Plumbers' Association. In a report on the subject, Mr. J. Jamieson, Engineer and Manager, stated that in March, 1932, approval was given to a scheme for offering on hire one type of gas water heater and in December, 1936, a scheme was approved for offering on hire-purchase terms a special type of multi-point heater. Each of these schemes had been successful, over 800 appliances having been fixed under the first scheme and over 1,000 under the second. Experience had shown there was a greater need for offering several types and sizes of water heating appliance on hire and hire-purchase terms to suit different households.

Gas and America's Health

Gas plays an important part in guarding the health of the American citizen. Samples and cultures sent to State health departments by physicians and health officers have to be tested and analyzed to detect the presence of disease-carrying bacteria. Gas is employed in no less than seventeen different processes carried out in chemistry and physics, in microbiology, and in serology, reports the New Jersey Public Utility Information Committee.

Water, milk, ice, sewage, river water, and trade wastes have to be tested for the presence of germs that may produce typhoid, pneumonia, venereal, and many other infectious diseases. A steady bunsen burner gas flame has been found most efficient for heating solutions, for drying, for sterilizing, and scores of other operations that require an exact heat to make the tests accurate.

A.R.P. Poster for Showrooms

Although the anxieties of the past week are happily abated, the Gas Industry will continue to perfect the A.R.P. schemes which were put into effect during the recent crisis. A.R.P. is being pressed forward, and the question on the lips of every man and woman in Britain to-day should still be: "How can I help?"

The Gas Industry has, in the past, become known for its outstanding gestures in relation to National patriotism; and gas showrooms and windows offer excellent facilities for live propaganda, which from an economy angle costs the undertaking nothing, but in return will show a patriotic gesture. All members participating in the B.C.G.A. Monthly Poster Scheme have received the double crown A.R.P. poster which we reproduce above with their regular service posters. The poster appeals for women volunteers.

The Institute of Vitreous Enamellers

Fifth Annual Conference

The arrangements for the fifth annual conference of the Institute of Vitreous Enamellers to be held at the Hotel Normandie, Knightsbridge, London, on Oct. 28, 29, and 30 are as follows: On Friday, Oct. 28, the President, Sir Harold Hartley, C.B.E., F.R.S., M.C., M.A., will preside over the annual general meeting at 4 p.m. in the afternoon and over the banquet in the evening at 7 p.m., accompanied by Lady Hartley. Sir Harold will be supported by many prominent leaders of industry, commerce, and science, closely connected with the enamelling industry. On the following day, Saturday, at 3 p.m., a Paper called "Scientific Aids to Vitreous Enamelling," by Messrs. J. G. Pearce, M.Sc., M.I.E.E., F.I.P., and G. T. O. Martin, Ph.D., will be read and discussed. At 9 p.m. there will be a theatre party to the Palladium. An excursion has been arranged for the Sunday to Hampton Court, Chertsey, Windsor, Eton, Staines, &c., with lunch at Windsor and tea at Beaconsfield.

Publicity Activities at Cambridge

Following the special Concession Period introduced last year, when discounts were offered by the Cambridge University and Town Gas Light Company to early purchasers of gas fires, the experiment has been repeated, with the result that the record figures of 1937 have been eclipsed by 35%, and the customary autumnal rush to some extent relieved.

Recently a Health Exhibition organized by the Borough of Cambridge was visited by large numbers of people, including many parties of school children, and the contribution gas is making to the cause of national fitness and well-being was exemplified in a tastefully designed stand and appropriate display. Among the films shown in the lecture theatre were "Nutrition" and "Children at School." As an appropriate link with this exhibition a series of cooking and beauty demonstrations were provided at the Company's showrooms, the opening ceremony being performed by Mrs. G. L. Bidwell, Chairman of the Cambridge shire Federation of Women's Institutes, who was introduced by the Engineer and Manager, Mr. J. Hunter Rioch. In her remarks, Mrs. Bidwell testified to the keen interest which had been shown by the Company in the work of the Women's Institutes. Not only had assistance been readily forthcoming, but evidently the Company and Mr. Rioch believed in the value of personal contacts. The Home Service section had provided talks and demonstrations in various centres throughout the country, and these were to continue in the near future. In the cookery lectures which followed, Miss J. E. Ford, of the Radiation Research Kitchen, explained how beauty came from within, and how modern kitchen equipment assisted in the cultivation of an improved personal appearance.

Another venture which has been received very well was the Housekeeping Exhibition which continued at Sawston until the end of last month. Here an exhibition was formally opened by the Chairman of the Sawston Parish Council, Mr. W. G. Hutchings, the Vice-Chairman of the Company, Mr. F. J. Dykes, presiding. Mr. Dykes commented upon the satisfactory manner in which the Company's enterprise in bringing gas to Sawston had been justified. Mr. Rioch expressed the hope that good support might be forthcoming as the exhibition had been organized by various manufacturers to enable Sawston customers to examine the latest types of gas appliance. Demonstrations of cookery by Miss D. M. Gillman, B.P.T.C., of Messrs. R. & A. Main, Ltd., held twice daily, proved a big attraction for local housewives, and a large entry for the cake-baking competition was anticipated. Excellent displays covering a wide range were provided by Ascot Gas Water Heaters, Ltd., and "Main" appliances were also shown on special stands. Another feature of the exhibition were home laundering demonstrations given by Miss K. Mulligan, representing Messrs. W. H. Dean & Sons, Ltd.

The cookery demonstrations instituted last winter have been resumed, and are to be held each Wednesday afternoon. Miss M. E. Ebden, Home Service Advisor, is conducting these.

Women's Gas Council

Birmingham Gathering.

Praise was given to gas by the Lady Mayoress of Birmingham (Mrs. E. R. Canning), who attended the annual tea of the local Women's Gas Circle at Birmingham on Sept. 29. The gathering held at the Palais de Danse, Edgbaston, was attended by 1,100 women. The chair was occupied by Councillor A. S. Giles (Chairman of the Gas Committee of the Birmingham Corporation). He spoke highly of the work of the Circle, which he said was a large and important body presided over most carefully by Miss O. L. Humphries. In the baking competition this year the entries numbered 389.

The Lady Mayoress spoke of the trials of cookery, which she said she was able to do out of her own experience. Great strides had been made under modern conditions, and a great deal had been made possible in regard to household cookery by the introduction of the modern gas cooker. She presented prizes to 16 winners in a baking competition arranged by the Circle. An award of "highly commended" was obtained for the baking of scones by Mrs. A. W. Smith, the wife of the Secretary and Manager of the Birmingham Gas Department.

The gathering had in mind the serious nature of the international crisis and despatched the following telegram to Mrs. Neville Chamberlain at 10, Downing Street in the name of the Lady Mayoress:

> "Eleven hundred women ot Birmingham attending the annual meeting of the Women's Gas Circle desire to convey to you and to your husband their heartfelt gratitude for your strenuous and courageous efforts to avert the horrors of war. They sympathise with you both in the great anxiety of recent weeks and pray that your efforts may be crowned with success."

Letters to the Editor

Salaries in the Industry

SIR,—Will you please permit me to express through your "JOURNAL" the pleasure I felt when reading the letter of Mr. F. G. Shaw, of Buxton, which you published in your issue of Sept. 21.

The setting up of a National Joint Industrial Whitley Council is a matter which would add to the efficiency of our Industry and to the welfare of its personnel.

It is surely a step in the direction towards a serious attempt to provide machinery for the open consideration of matters affecting the technical, administrative, and clerical staffs of our Industry.

Yours, &c.,
B. F. CONOLLY.

51, *Hatton Gardens,*
Mitcham, Surrey,
Sept. 26, 1938.

Value of the Lighting Load

SIR,—Arising out of the discussion on the Paper by Mr. Howells, of Abergavenny, and the remarks passed by various speakers upon the value of the lighting load, I would add that I concur with their observations, and in support of the value of this load, I have pleasure in submitting my observations in connexion with my own Undertaking, which are revealed in the following table, and the necessity for realizing the value of the lighting load is more apparent, due to the fact that the majority of this business is obtained at the maximum price, via the prepayment meter:

Effect of Electrical Competition.

Year.	Meters Brought Away.	Fittings Removed.	Extra Lights Fitted.	Average Consumption per Prepayment Consumer.
1934–5 ..	39	443	287	10,288
1935–6 ..	73	229	218	10,696
1936–7 ..	59	226	177	10,360
1937–8 ..	34	97	196	11,819

This has been successfully combated with the introduction of a new plant, which was brought into operation in December, 1936. As a result, there is improved service to the consumer, combined with the delivery of gas of constant quality, composition, specific gravity, and adequate pressure.

Yours, &c.,
H. MAYCOCK, A.M.I.Mech.E.,
Engineer and Manager.

Gas-Works, Abertillery,
Oct. 3, 1938.

B.C.G.A. Display Schemes for 1939

Here is a selection of the displays which member undertakings will receive from the British Commercial Gas Association under the new window display, poster, and showcard schemes for 1939. These displays will be designed specifically to link up with the national advertising schemes, and all the material will remain the absolute property of the undertakings participating in the scheme.

Gasholder Repairs

Referring to the method of gasholder repair described and illustrated by Mr. W. G. Lucas of the Long Buckby Gas-Works in our issue of Sept. 21, Mr. Leonard Bott, of Stoke-on-Trent, writes to us to say that in his opinion the method is a great advance on the majority of repairs that one comes across when visiting gas-works to inspect the gasholders. It is, he continues, a pleasure to find gas engineers who realize that if a gasholder repair is necessary it should be done in a thorough manner. His further comments are as follows:

"Recently one who claims to be an authority in gasholder maintenance informed me that the majority of the repairs he found necessary could be done by employing single bolt patches. In my opinion a single bolt patch is never sufficient to repair a gasholder, because it implies that the bolt is to depend upon sheeting which is already reduced to paper thickness and whose nature is converted to biscuit brittleness.

"While giving full marks to Mr. Lucas for his method, I wish to draw your attention to a method introduced and employed by me where no holes are required other than those needed for the bolts to be permanently secured therein.

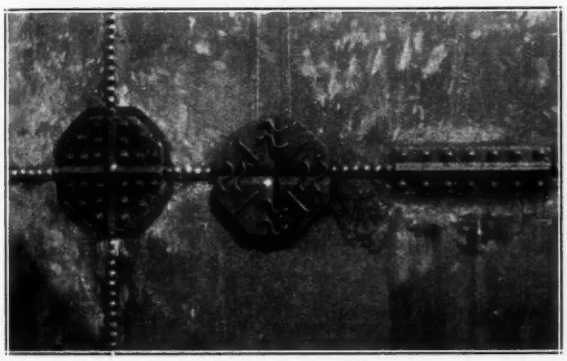


Fig. 1.

"Fig. 1 shows this method and illustrates not only the bolts in position but also a patch suspended in reverse to show how the bolts inside the gasholder have considerably more bearing than a Standard Whitworth bolt. Further, by crossing the double thickness of the riveted seam these bolts take hold of the strongest part of the gasholder sheeting.

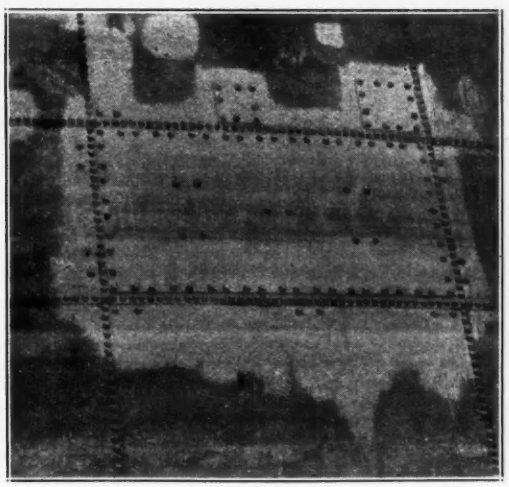


Fig. 2.

"Fig. 2 shows how several full plate patches were fitted to a half-million gasholder, and it can be seen that the bolts are so disposed in the full plate patch that it is actually connected to eight surrounding sheets and the bolts cross four riveted seams. No holes other than those required for the bolts, which are $\frac{3}{4}$ in. diameter, are necessary, and as can be seen the appearance, when finished, is quite as pleasing as the adjoining rivet heads."

Forthcoming Engagements

October.

6.—**I.G.E.**—Research Executive Committee, 2.30 p.m.
6.—**Midland Juniors.**—Presidential Address of A. W. Attwood.
7.—**I.G.E.**—Joint Committee on Complete Gasification Under Pressure (16, Old Queen Street, S.W. 1), 3 p.m.
7.—**North of England Association.**—Autumn Meeting at Sunderland.
7.—**Southern Association (Eastern District).**—Meeting at Gas Industry House, 2.30 p.m. Discussion on A.R.P.
8.—**Manchester and District Juniors.**—Annual General Meeting at Bolton. Visit to Bolton Gas Works.
8.—**Scottish Western Juniors.**—Presidential Address of N. C. Sturrock.
8.—**Wales and Mon. Juniors.**—Meeting at Swansea. Presidential Address of F. S. Johns.
10.—**I.G.E.**—Finance Committee, 1.45 p.m.; Membership Committee, 2.15 p.m.; General Purposes Committee, 3 p.m.; Benevolent Fund Committee of Management, 4.30 p.m.
11.—**Federation of Gas Employers.**—Central Committee, Gas Industry House, 12 noon.
11.—**I.G.E.**—Council, 10 a.m.
11.—**N.G.C.**—Central Executive Board, 2.30 p.m.
11.—**London and Southern Juniors.**—Opening Meeting. Presidential Address of S. C. Waldock.
12.—**I.G.E.**—Board of Examiners, 2.30 p.m.
13.—**Midland Association.**—Autumn General Meeting, Grand Hotel, Birmingham.
15.—**Western Juniors.**—Meeting at Bath. Address by Mr. R. Robertson, President of the I.G.E.
18.—**I.G.E.**—Gas Education Executive Committee, 11 a.m.; Gas Education Committee, 2.30 p.m.
19.—**London and Southern Juniors.**—Visit to Brentford Works of the Pyrene Company and to the Gas Fair at the North London Exhibition.
20.—**Eastern Counties Association.**—Autumn Meeting at Gas Industry House, 2 p.m.
20.—**Midland Juniors.**—Visit to West's Gas Improvement Company, Ltd., Manchester.
20.—**Southern Association (Western District).**—Commercial Meeting, Rougemont Hotel, Exeter, 2.30 p.m. Committee Meeting, 12 noon.
22.—**Scottish Western Juniors.**—Visit to Douglas Firebrick Company, Ltd., Dalry.
27.—**Coke Oven Managers' Association.**—Annual Dinner, Hotel Victoria, Northumberland Avenue, London.

November.

1.—**I.G.E.**—Council, The Institution of Mechanical Engineers, 9.30 a.m.; Council (continued), the Institution of Mechanical Engineers, 4.30 p.m.
1-2.—**I.G.E.**—10th Autumn Research Meeting at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, London, S.W. 1.
3.—**S.B.G.I.**—Autumn General Meeting, May Fair Hotel, W. 1. Council Meeting at 56, Victoria Street, S.W. 1, 11 a.m.

Athletic and Social

Belfast Veterans Entertained.

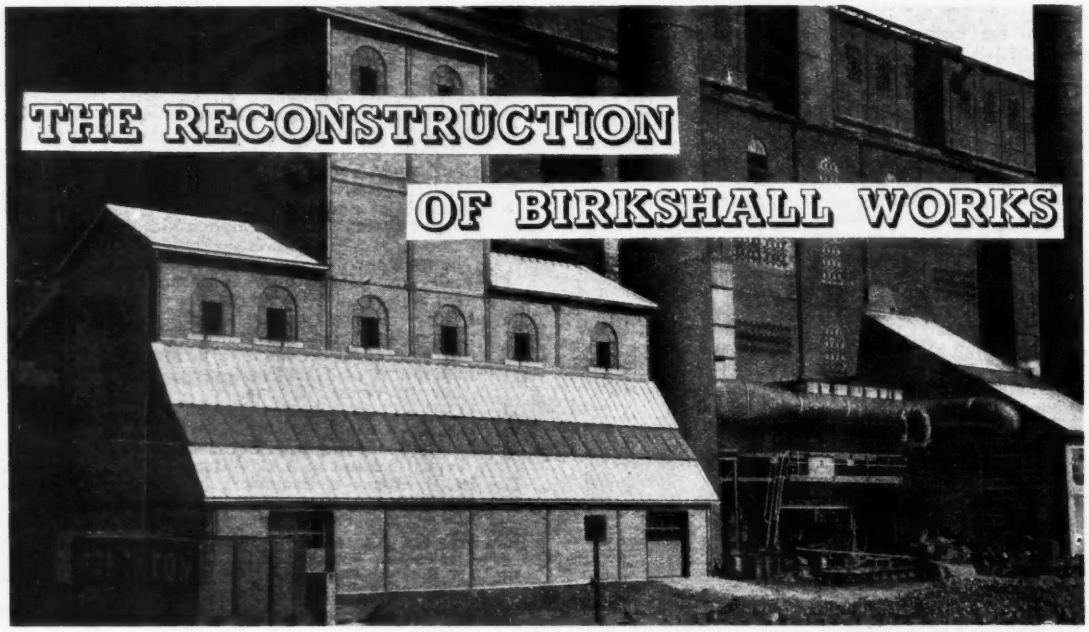
Five veteran officials of the Belfast Gas Department were entered at dinner in Thompson's Restaurant on Friday last to mark their retirement. They are Chief-Inspector Frederick H. Walker (47 years' service), and Inspectors David M'Clenaghan (46 years), David Clarke (40 years), James Johnston (39 years), and Richard Sinton (37 years). Mr. V. Hunter (auto-meter inspector) presided, and tributes were paid by Mr. C. Handforth, Mr. J. Montgomery, and Mr. Hugh M'Cormick. Mr. W. J. Doran, the new chief inspector, handed over tokens of appreciation.

Newbridge Male Voice Choir.

A combined concert was given at the Pavilion, Bath, on Sunday, Sept. 25, by the Newbridge (Bath) Male Voice Choir and the Bath Spa Imperial Silver Prize Band. The Newbridge Male Voice Choir has broadcast on several occasions from the West Regional, while the Bath Spa Imperial Silver Prize Band has been the winner at various Festivals during the year. The conductors of both the choir and the band are employees of the Horstmann Gear Company, Ltd.

Lincoln Bowls Competition.

The final of the knock-out competition for the Lincoln Gas Department bowls trophy was won last week by W. Graham, who defeated H. Gregory by 21 shots to 16. Mrs. George Wright, wife of the Engineer and Manager, presented the trophy.



The Retort House, showing the annexes for the Producers and Waste Heat Boilers and also the Boiler Inlet Flue, Discharge Pipe, and Waste Gas Re-circulation Pipe.

Centralization at Bradford

Last Wednesday the Lord Mayor of Bradford, Alderman Henry Hudson, inaugurated the reconstructed and centralized Birkshall Works of the Bradford Corporation Gas Department. We give an account of the opening ceremony and a description of the new works.

The opening ceremony was to have been performed by Lord Stamp, but owing to the international crisis he was unable to attend, and his place was taken by the Lord Mayor of Bradford (Alderman Henry Hudson). In the presence of a large gathering the Lord Mayor formally opened the plant and unveiled a tablet erected to commemorate the occasion.

After the unveiling ceremony the guests were conducted on inspection tours.

There were 150 people present at the luncheon at the Connaught Rooms, where the Lord Mayor read Lord Stamp's speech proposing the toast of "The Gas Industry."

In the speech Lord Stamp remarked that the inauguration of the reconstruction and centralization of a great municipal gas manufacturing plant was a remarkable confounding of the prophets of a few years ago. It was thought then that the Gas Industry was fighting a rearguard action leading, if not to overwhelming defeat, to gradual and respectable disease. Now, for a variety of reasons, these prophets were wrong. They did not appreciate that gas occupied a unique position for achieving certain results which could not be equally well obtained in any other way; they did not recognize the scientific possibilities of the use of by-products, with their immense effect upon costs; they did not reckon for this Industry taking hold of modern methods of publicity. The Gas Industry was full of vigour, and required no apologists; it was almost a work of supererogation to propose its health. Bradford's great undertaking, and the extensions of it now inaugurated, were worthy not only of municipal enterprise but also a fine development in the history of the Industry itself.

Mr. R. Robertson, President of The Institution of Gas Engineers, responded to the toast, and Sir Frederick J. West, Junior Vice-President of the Institution, proposed "The City of Bradford," with which he coupled the name of Alderman T. J. Robinson, the Lord Mayor elect. He spoke of the importance of local government work, and pleaded for greater interest to be shown in it by the public.

Alderman Robinson, responding to the toast, paid tribute to past Managers of the Gas Department, and particularly to Mr. E. Crowther. Mr. G. E. Currier, the present Manager, was carrying on to the absolute satisfaction of the Committee, and had contributed much to the success of the extension.

Alderman F. J. Cowie (Chairman of the Gas Committee) proposed "The Guests" and paid tribute to the heads and staff of the Gas Department and to the contractors. Mr. E. Crowther, the former Bradford Gas Engineer, who has just been appointed Chief Engineer and Assistant General Manager of the Newcastle-upon-Tyne and Gateshead Gas Company, responded in place of Mr. A. W. Smith, Secretary and General Manager, Birmingham Gas Department, and was supported by Mr. L. Hartley, representing the Contractors, who presented Alderman Cowie and his deputy-chairman, Mr. Alton Ward, with souvenirs.

Immediately prior to the reconstruction and centralization of the manufacturing plant at the Birkshall Works, there were three manufacturing stations—viz.:

BIRKSHALL WORKS.—Consisting of four benches, each of 20 Woodall-Duckham downwardly heated retorts in regenerative settings. The capacity of this Works was 38 million cu.ft. per week.

THORNTON ROAD WORKS.—Consisting of eight beds of Glover-West vertical retorts having a productive capacity of 14 million cu.ft. per week. This installation was erected in 1911, being one of the earliest of its type. The plant has given good service throughout its life.

VALLEY ROAD WORKS.—One Humphreys & Glasgow carburetted water gas plant, capable of producing 8 million cu.ft. per week. There was also installed at this Works a crude benzole plant, erected during the last war, after which it remained idle until 1933, when, after being slightly modified, it was again put to work, and continued working until the present reconstruction and centralization scheme was commenced.

Now that the reconstruction and centralization scheme is completed, manufacture of gas is confined to Birkshall Works and gas is pumped to the various holder stations for distribution to the district. Thornton Road Works is closed down entirely and the carburetted water gas plant has been transferred from Valley

Road to Birkshall, leaving Valley Road Works as a distributing station only.

Diary of Main Events.

Jan. 31, 1936..	.. Gas Committee passed resolution recommending the adoption of the scheme.
March 10, 1936..	.. City Council sanction.
May 20, 1936..	.. Public enquiry held by the Ministry of Health Inspector at the Town Hall.
July 2, 1936..	.. Formal sanction of the Ministry of Health.
Aug. 5, 1936..	.. First sod (2¼ million cu.ft. gasholder foundation) cut by the Chairman of the Gas Committee, Alderman F. J. Cowie.
May 7, 1937..	.. Manufacture of gas at Valley Road Works ceased.
Aug. 23, 1937..	.. C.W.G. manufacture at Birkshall Works commenced.
Dec. 20, 1937..	.. Coal gas manufacture in new upwardly-heated vertical retorts commenced.
July 29, 1938..	.. Manufacture of gas at Thornton Road Works ceased.

The Carbonizing Plant.

The reconstruction of the continuous vertical retorts involved the dismantling of an existing bench of five settings, each of four 62-in. retorts and each provided with its own producer and recuperator, and its replacement by a bench of thirty of the latest type upwardly-heated 62-in. retorts, fired by means of a separate battery of five breeze-burning producers. The scheme also included modifications and additions to the overhead coal and coke storage equipment, and the installation of a new waste-heat boiler.

The possibility of effecting this type of reconstruction, whereby six retorts are built in space equivalent to that occupied by each former setting of four, and separate producers are located in a convenient available space, is due to the far more compact design of the modern retort setting. This design has been developed in the course of evolution from the settings of four recuperative retorts to the modern bench of non-recuperative retorts with "battery type" producers. The heat losses resulting from the abolition of recuperation have been more than made good by the employment of a larger degree of waste-heat recovery by means of fire-tube boilers than was possible with recuperative retorts, and at the same time the initial and maintenance costs associated with recuperators have been eliminated. In the present instance the new bench is capable of carbonizing 198 tons of coal per day, whereas the old bench could carbonize 105 tons per day. The guaranteed output of the new bench is 19,500,000 cu.ft. of gas weekly, with full allowance for scurfing retorts, and this output is readily obtainable in normal working practice without in any way pressing the retorts.

The thirty new retorts are designed according to the latest Woodall-Duckham practice. They are about 25 ft. high, rectangular in plan, and tapered to allow continuous regular descent of the coal. They are 62 in. long and 10 in. wide at the top. The arrangements for feeding coal into the retorts, for regulating its travel by means of the coke extractor, for heating it during its passage, and for internally quenching the coke, follow the standard Woodall-Duckham principles. In the reconstruction it was found possible to retain the setting steel-work, and develop the bracing so as to be suitable for the modern retort.

Gas Offtakes and Collecting Mains.

It was decided to adopt the latest design of gas offtakes and collecting mains, which have been much improved in recent years. In this design the gas issues from the top of the retort through an offtake pipe situated at one end of the retort. The coal entering the retort is kept clear of this offtake by a special deflecting plate which allows ample space for the gas flow from the coal. The offtake pipe, which is of suitable area to ensure equalization of pressures and is so arranged as to be readily cleaned leads the gas into a liquor-sealed dish valve, which is connected to the top of the collecting main. This valve provides for the closing-off of the individual retort from the collecting main, when the retort is being scurfed or is let down cold. Each offtake pipe is fitted with a spray whereby it is sprayed with hot ammoniacal liquor. This liquor keeps the valves and offtakes clean and also serves to seal the dish valve when the retort is shut off from the main.

Two collecting mains are provided, one situated along each side of the bench. The collecting mains are of the dry type and are arranged with a fall towards a cleaning well in the centre, where heavy tarry products are deposited and removed at intervals. The mains are occasionally flushed with hot liquor.

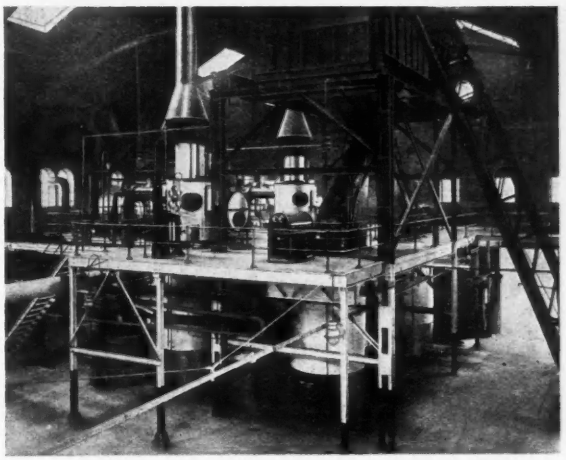
To supply the gas for heating retorts, five producers are provided at ground level in the annexe built at the north-west corner of the retort house. The producers are arranged so that any producer may be shut down without interfering in any way with the working of the other producers. The gas from any producer may be taken to any of the retorts. The producers are of the step-grate type and are constructed with ample grate area for the efficient heating of thirty retorts when using a mixture of coke and breeze. When using run-of-retort coke any four producers will efficiently heat the thirty retorts.

Waste Gas Flues and Waste Heat Boiler.

The flow of waste gases from the combustion chambers of each retort is controlled by two dampers, one for each side of the retort. The waste gas from each pair of retorts passes into a common flue and out through a neck into the waste gas main. The necks and main are formed of mild steel casings lined with insulating brick and insulating firebrick. The waste gas main conveys the gases either directly to the existing chimney or to the new waste-heat boiler inlet flue.

The boiler inlet flue has been arranged to convey the gases either to the existing boiler or to the new boiler. The chimney has been provided with an automatic regulating device for maintaining constant draught in varying wind conditions. The new boiler, which, like the existing boiler, is of the Woodall-Duckham horizontal fire-tube induced-draught type, is designed for a working pressure of 120 lb. per sq.in. It is of a size to deal with the waste gases from the whole thirty retorts.

In order that the surplus of steam available for general works purposes may be maintained when some of the retorts are not at work, provision is made so that a supplementary supply of producer gas can be mixed with the waste gases before they are passed to the boilers, an "augmentation flue" being provided from the producers to the waste gas main. In addition, in case it may be required to raise this supplementary supply to a proportion which would give rise to temperatures which might be injurious to a boiler designed for waste-heat firing, means are



Perspective View of the Carburetted Water Gas Plant, showing the Generator, Carburettor, Superheater, Washer, Waste-Heat Boiler, Coke Elevator, and Storage Bunker, and more particularly the front portion of the Operating Floor with the Automatic Mechanical Operator, Automatic Coke Charger for the Generator, Gasmaker's Desk with Grouped Indicators, Rolling Stack Valves, &c.

provided for re-circulating a portion of the waste gases leaving the boilers into the waste gas main, thus lowering the temperature of the gases entering the boilers to within safe limits. A superheater is fitted in the inlet flue to the new boiler.

The induced draught fan on the new boiler is driven by means of a non-condensing type steam turbine. Water from the outlet coal gas condensers is used for feed water, and this is further pre-heated to about 160° F. by means of exhaust steam from the fan turbines in a pre-heater designed and made by the Gas Department. The boiler feed pumps are of the Weir vertical type.

Modifications to Coal and Coke Storage Equipment.

Coal is brought to the vertical retort plant by the existing handling plant, being delivered into the overhead storage hoppers by means of the existing gravity bucket conveyor. Prior to the reconstruction the overhead hoppers were arranged so as to provide a coal hopper over each group of four adjacent retorts, a coke hopper over the producer of each setting, and a free space over the recuperator to allow room for the gas uptakes. The fact that the new bench contains ten more retorts than the old has made additional overhead coal storage capacity necessary.

This has been obtained by modifying the overhead hoppers to form a continuous range of coal hoppers, the division plates being cut, where necessary, to allow free flow of coal from one compartment to another, and the free space left above the former recuperators being now included in the coal hopper space.

Since the existing overhead hoppers are now used exclusively

for coal, it has been necessary to supply new accommodation for storage of the coke and breeze used on the plant.

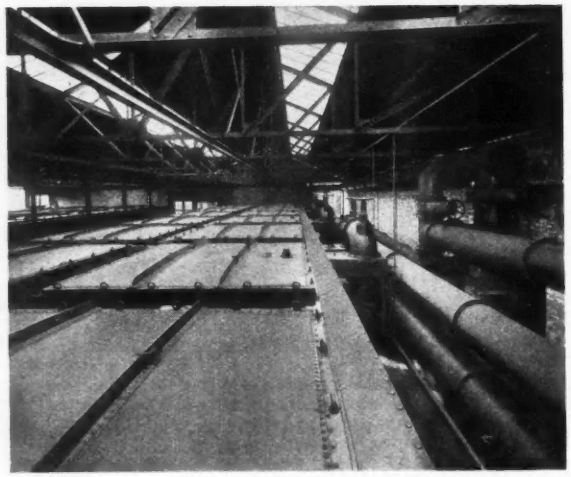
For storage of producer fuel an elevated steel hopper, affording accommodation for twenty-four hours' supply to the producers, has been installed in the producer annexe above the producer battery; while, for storage of coke used in the retorts at starting-up, or after scurfing, a steel hopper has been arranged between the coal hoppers of B1 and B2 benches. The sloping plates of both hoppers are lined with blue tiles. Both the producer fuel hopper and the retort coke hopper are served by means of the gravity bucket conveyor, a chute being provided to deliver coke from the conveyor dumper chute to the producer fuel hopper.

The whole of the retort house low-pressure gas lighting has been considerably improved by the installation of Messrs. Foster & Pullen's lamps.

Carburetted Water Gas Plant.

The scheme provided for one new section of Humphreys-Glasgow automatically operated carburetted water gas plant, combined with a waste-heat steam generating plant, and having a capacity in twenty-four hours of 1,400 000 cu.ft. of carburetted water gas of 500 B.Th.U. per cu.ft. It also included dismantling of the existing section of hand-operated carburetted water gas plant and auxiliary plant at the Valley Road Works, and its reconstruction with automatic operation and re-erection alongside the new plant at Birkshall Works. The work was entrusted to Messrs. Humphreys & Glasgow, Ltd.

The new and the transferred plants are erected in an existing house originally built for a retort house. Both plants are identical in capacity and design, and are arranged for the most economical extension by a further larger section, should this be required at some future time. Both plants are constructed for automatic



The four 30 ft. × 30 ft. × 6 ft. Purifier Boxes for Carburetted Water Gas, showing the Coal Gas Purifiers at top left.

charging and operation, and include the most advantageous application of the three-phase cycle back-run process, which facilitates the control of temperatures throughout the apparatus, and by returning to the generator (for use in the production of gas) heat hitherto contained in the blast products and gas leaving the generating plant effects marked saving in the consumption of generator fuel.

Further appreciable saving in generator fuel is effected by the H. & G. system of secondary combustion, which intimately mixes the secondary air with the generator blast gases, and suitably proportions this air to the wide variations, during each "blow," of combustible in these blast gases.

Each generating section is equipped with a Humphreys-Glasgow mechanical operator, which operates all working valves of the plant in safe and proper sequence at any desired intervals, thus eliminating gas-making labour and substituting mechanical precision for human fallibility and inefficiency in the operating routine. Moreover, it enables the supervisor easily and quickly to adjust the relative durations of the different phases of the operating cycle, as well as the total length of the cycle, to the particular character of the fuel and oil then being used. Change can be made instantly and at will from automatic mechanical operation to the most convenient manually controlled mechanical operation, and *vice versa*, and the operation of the various individual valves can be independently suspended at will, all while providing the operating safety resulting from the interlocking, purging, and ventilating systems.

The mechanical coke-charging and distributing apparatus, fitted to each plant, is actuated by the mechanical operator, and no hydraulic pressure is required. A properly regulated supply of coke is fed into the generator at any predetermined time during each operating cycle, without interrupting the gas-making processes, thus maintaining the fuel bed at practically constant height while ensuring the proper distribution of the coke. Constant conditions of maximum gas-making efficiency are thus preserved and coking labour is eliminated.

Each section of generating plant has combined with it a waste-heat steam generating plant, specially designed for the efficient, labourless utilization of the sensible heat in the escaping blast products, as well as of their latent heat developed by secondary or tertiary combustion. With the generator regulated for minimum fuel consumption the waste-heat boilers will generate 45 lb. of steam from and at 212° F. per 1,000 cu.ft. of carburetted water gas of 500 B.Th.U., and 60 lb. of steam from and at 212° F. per 1,000 cu.ft. of blue water gas. The boiler stacks are fitted with "Centriflovane" grit arrestors.

The exhauster house contains two Bryan Donkin vertical type steam engine-driven exhausters, and the two transferred units of steam turbine blowing plant. A new workshop is provided to enable running repairs of the water gas plant to be carried out practically *in situ*. Also incorporated in the buildings is a mess-room for the plant shift attendants.

Condensers.

Two Humphreys & Glasgow new "Spiral" high duty vertical tube multi-pass condensers have been installed, each of which is of suitable capacity for handling the gas from one section of the carburetted water gas plant working alone. The multi-tube vertical condenser from Valley Road has also been transferred and re-erected and connected in parallel with the two new condensers. The connexions to the condensers are arranged so that the condensers can be worked singly or in parallel.

Two new Cyclone tar extractors, each to deal with the gas from one section of the generating plant, are provided. The cyclones are arranged for working in parallel and are installed between the condenser and the relief gasholder. Two P. & A. tar extractors were transferred from Valley Road and re-erected. Provided with new 16-in. outlet gas valves, they were connected up with the 24-in. gas main from the exhauster, a by-pass connexion with a new 24-in. valve being incorporated. The oil storage tanks at Valley Road were transferred and re-erected at Birkshall.

The water supply to the gas condensers is in a closed circuit, the discharge from the condensers passing over a cooler before being re-circulated. Water for the boiler feeds is drawn off from the circuit, and this, together with water lost by spray and evaporation, is automatically made up with cold town water to the tank at the cooler base. Circulation is maintained by a Worthington-Simpson centrifugal pump. The cooler is of the natural draught open type, louvred all round, and was constructed by the Davenport Engineering Company, Ltd. Its capacity is 6,000 gallons of water per hour, cooling from 110° F. to 78° F. with atmosphere 70° F. and 70% humidity.

The two-lift spirally-guided gasholder of 250,000 cu.ft. capacity, in steel tank, erected at the Valley Road Works in 1930 by Messrs. Robert Dempster & Sons, Ltd., Elland, has been dismantled by them, transported plate small, and re-erected on a new foundation at these works, and is again used as a carburetted water gas relief holder. During dismantling, considerable care had to be taken to avoid fracturing the gasholder sheets when stripping the riveted seams, and prior to erection sheet edges were straightened to ensure that the gas-tightness would be in no way impaired. The gasholder is fitted with two roller-type carriages, and presents no unusual features of design or construction. Besides the usual vertical-type wheel valves on the gas pipes, there is an automatic valve incorporated in the outlet which is controlled from a tappet fitted to the top curb; the holder is completely isolated on the outlet immediately prior to coming to rest. This precautionary measure obviates the possibility and danger of creating a vacuum under the crown of the holder. In addition, an electrically-operated siren has been fitted to give audible warning to the shift attendants, should the holder get dangerously low.

The reinforced and mass concrete foundation work for this holder was carried out by Messrs. F. C. Construction Company, Ltd. The foundation gave rise to an unusual problem, as the bore holes showed that underneath the site there was a seam of coal which had been worked many years ago. The manner of working was to drive headings fairly close together, leaving pillars of coal in between to support the ground overhead. In some cases these workings had been back-filled with shale and other material, which in the course of years had settled and gave no real support to the upper layers. The site was tunnelled with these coal workings at a depth of about 12 ft. below the ground surface.

It is essential that the foundation for a gasholder shall remain level, and settlement cannot be tolerated. It was, therefore, decided to rest the foundation slab on supports driven down to the rock below the coal. The strata, however, were too hard for pile driving to be possible. The foundation has, therefore, been made

by digging holes 4 ft. square, from the ground level to the rock below the coal, for the formation of massed concrete piers. On the top of these piers rests a reinforced concrete slab, which has been designed to be capable of carrying the loads thrown by the holder. This method of dealing with the foundation has proved perfectly satisfactory.

Purifiers.

The new purifier installation is erected on the site previously occupied by a set of six old water lute boxes, 32 ft. by 24 ft. by 5 ft. deep. The old purifiers, elevated on a cast-iron grillage supported on cast-iron columns, were housed in a building 136 ft. 6 in. by 115 ft. 6 in. by 31 ft. high to eaves, built in three bays, with timbered roof in three spans. The purifiers occupied two bays, the third having an elevated revivifying floor. The contract for the demolition of the existing purifiers and buildings, and the erection of the new purifiers and house, including the necessary 24-in. diameter mains and coupling-up, was entrusted to Messrs. Clapham Brothers, Ltd., of Keighley. The new plant comprises two sets of purifiers, one known as "B" Set (four boxes, 40 ft. by 30 ft. by 6 ft. deep) for coal gas, and "C" Set (four boxes, 30 ft. by 30 ft. by 6 ft. deep) for carburetted water gas. The purifiers are of cast-iron construction and of modern design. Both sets of purifiers are housed in a steel building, 138 ft. by 117 ft. by 15 ft. 3 in. ground level to eaves, built in two bays, each 58 ft. 6 in. span.

An important feature of this contract was the short time available between the shutting-down of the old purifiers and the time when the new set must be in operation. The demolition was commenced on April 15 and completed on May 22, approximately 3,500 tons of masonry and iron and steel work being removed. The Gas Department carried out the foundation work for the new plant, and on May 28 the erection was commenced, the purifiers being completed and tested by Aug. 14. The contract was carried out in its entirety in a total period of seventeen weeks.

Connersville Meters.

A Holmes-Connersville meter having a capacity of 250,000 cu.ft. of gas per hour has been provided on the coal gas stream, and one having a capacity of 100,000 cu.ft. per hour has been installed to measure the carburetted water gas. Both meters are equipped with direct reading counters, differential pressure gauges, and other usual equipment. A novel feature of each meter is a tachograph which shows the rate of gas throughput in terms of thousands of cubic feet per hour, while above the dial a chart provides a continuous record. It is interesting to note that this additional metering capacity, amounting to 350,000 cu.ft. per hour, is all located in the gangway around the existing 150,000 cu.ft. per hour wet-drum meter.

A Holmes-Connersville exhauster has been installed, capable of handling 200,000 cu.ft. of coal gas per hour when running at a speed of 290 r.p.m., suitable for exerting a suction of 5 in. w.g. and delivering against a pressure of 45 in. w.g. The steam engine driving the exhauster is of the vertical, totally-enclosed, forced-lubricated type, fitted with automatic cylinder lubrication. The steam supply at a pressure of 90 lb.-120 lb. per sq.in. passes through a steam separator and trap before reaching the engine.

Arrangements have been provided whereby the gas from Birkshall Works can be delivered to any of the other stations by means of a Holmes-Connersville compressor. The capacity of the machine is 250,000 cu.ft. per hour, as measured at inlet conditions when running at the speed of 595 r.p.m. against a pressure rise of 7 lb. per sq.in. The compressor is direct-coupled by means of a pin-type flexible coupling to a vertical, totally-enclosed, double-acting, twin-cylinder steam engine, fitted with automatic lubricating arrangements.

Steam is supplied at a pressure of 90 lb.-120 lb. per sq.in., and the exhaust is against a back pressure of 35 lb. per sq.in. The exhaust steam at this pressure is used in the retort house for steaming the charge in the vertical retorts, and also for admission to the producers. Automatic valves are fitted to the system, whereby a surplus of steam is released to atmosphere and a deficiency in the retort house automatically made good with live steam. A constant pressure regulator controls the speed of the engine.

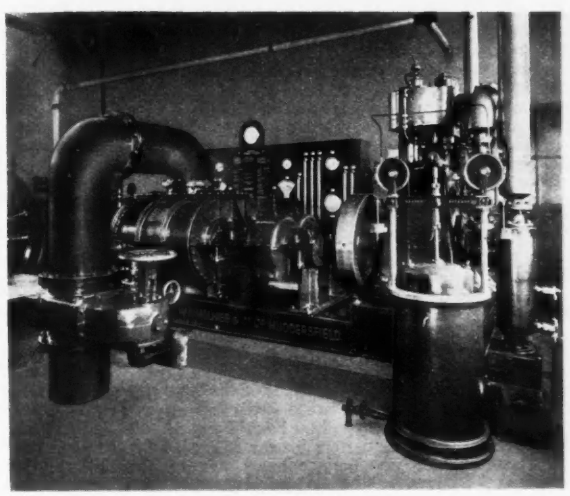
Condensers and Water Cooling Tower.

Two Holmes super type, horizontal tube, water-cooled condensers have been erected to supplement the existing condensers on each gas stream. Each of the new condensers has a capacity of 2 million cu.ft. of gas per day, and is made of mild steel plates throughout, welded together at the joints, the cooling being arranged by nine nests of tubes, giving a total cooling area for each condenser of 6,230 sq.ft. Each unit is capable of cooling the gas from 170° F. to 60° F., with water at an inlet temperature of 55° F. The connexions in both cases are 24 in. in diameter. The water for cooling circulates in a closed circuit, and is cooled by means of a Bradford patent natural-draught open-type cooler, by the Davenport Engineering Company, Ltd., and is similar to the one installed for the carburetted water gas condenser water. Water is drawn from the circuit as required for boiler feed purposes in the retort house, and this is automatically made up with cold town water to the tank at the cooler base.

Benzole Plant.

During the Great War a crude benzole plant was installed at the Valley Road Works. At the end of the war it was shut down and not re-started until 1933, and then did good work until last year, when it was dismantled and portions transferred and re-erected at Birkshall to form the nucleus of the new benzole plant. The still, condenser, and superheater were re-used, and a new washer, oil heat exchanger, and oil coolers were provided. The plant has a capacity of approximately 1,000 gallons of crude benzole per day.

The oil heat exchanger and oil cooler is made up of a continuous battery of seven units of Wolff-type coolers. The water used for oil cooling is drawn from the bottom of the No. 1 gasholder tank and re-delivered to the top. The washer is of the Holmes-Multifilm brush static type, by Messrs. W. C. Holmes & Co., Ltd., and has a capacity of 7½ million cu.ft. of gas per day. A patent sextuple monobloc pump, direct coupled to an electric motor, has been provided for circulating the absorbing oil. Special spray pipes are fitted on top of the washer, so designed that the spray holes may be cleaned at any time with the washer working, and in addition the pipes may be rotated so as to direct the spray on to the sight glasses for cleaning purposes, and also to ascertain that a good delivery is being given by the pump.



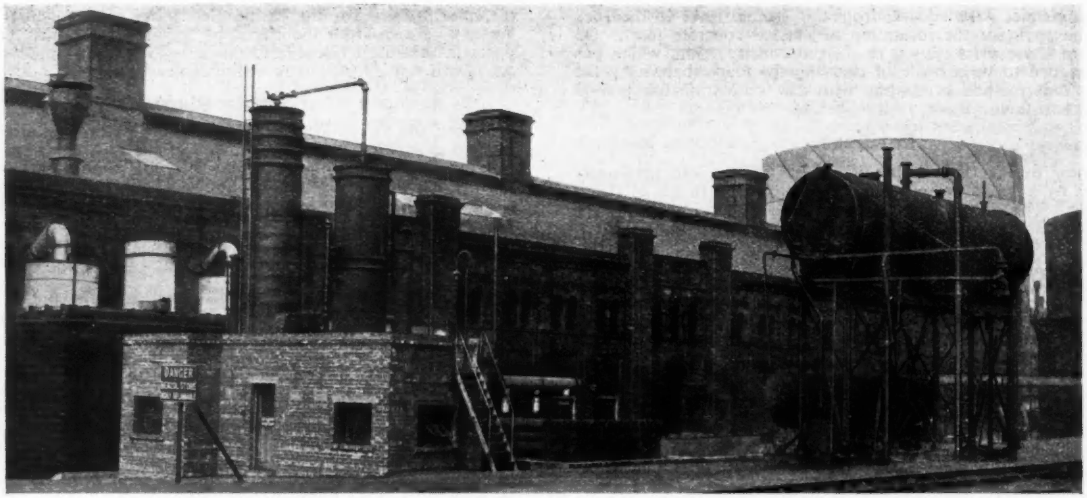
The Holmes Connersville Steam Engine-Driven Exhauster with Regulator and Overspeed Governor.

The pumps for circulating the benzolized oil, debenzolized oil, benzole, and water are situated in a new pump house built. The pumps are of the Worthington-Simpson centrifugal type, mounted in line, and driven by a high-speed, totally-enclosed steam engine in duplicate through shafting and chain drives; each pump is fitted with a friction clutch so that any pump can be easily isolated. The oil, naphtha, and benzole storage tanks have been transferred from Valley Road, and re-installed in one large concrete pit.

Gasholder.

A new gasholder has been erected at Birkshall Works by Messrs. Clayton, Son, & Co., Ltd. The holder is of the spirally-guided water-sealed type, and has a capacity of 2¼ million cu.ft. There are four lifts, 31 ft. deep, and the steel tank is 163 ft. 2 in. in diameter and 32 ft. deep. The roller carriages are fitted with the latest improved internal forced-feed lubrication. The total weight of steelwork in the gasholder and tank is approximately 2,000 tons, and the tank will hold about 4¼ million gallons of water, having a weight of 17,500 tons.

The foundation for carrying this holder, like that for the relief holder, required special and serious consideration, as trial excavations and bore holes revealed extensive coal workings about 12 ft. below the surface, and extending over more than half of the site. In some cases these old workings had been filled in with shale and other material, which in the course of years had settled; others had never been filled in, with the result that there was a site with a perfectly good subsoil which could not be relied on by reason of cavities below the surface. It was essential that uneven settlement should not occur, and it was therefore necessary



General View of the Benzole Plant, showing the Still, Condenser, Heat Exchanger, Pump House, and Tanks for Storage and Loading.

to build the foundation slab on supports taken down to the solid rock below the coal seam, and support the load entirely independently of the tunnelled earth. It was found that the subsoil was too hard to allow of driving piles, and instead the supports were made of mass concrete piers, 4 ft. square, from the firm rock strata to the under-slab level. In all, 136 piers were put in. The slab itself is of reinforced concrete construction, resting on top of the piers, and the whole suitably designed to carry the loads thrown upon it.

An electric generator has been installed in part of the old meter house, adjoining the exhauster house, as a standby supply for town's current. The Metropolitan-Vickers alternator is capable of an output of 150 kW, and is driven by a Bellis and Morcom compound vertical steam engine. An automatic voltage regulator, made by Metropolitan-Vickers, is fitted, and power-factor correction maintained by static condenser.

Laboratory.

Previous to the reconstruction the main laboratory was situated at Mill Street Gas-Works, with a small laboratory at each of the works. A new laboratory has been built at Birkshall Works, which is now the headquarters for the whole of the chemical staff. The brick building was designed and built by the Department's own staff. Other than the general laboratory room there are a calorimeter room, balance room, chief chemist's office, and a room for the staff containing wash-bowl and shower, &c. The whole is equipped with modern apparatus.

A new messroom has been provided for the Birkshall Works staff. The messroom has accommodation for about 150 employees and is provided with full washing accommodation and shower baths. It is fully equipped with gas heating and cooking apparatus, and hot dinners are provided for those of the men who desire them. The messroom is managed by a committee of five elected representatives of the men themselves.

A new coke screen has been fitted over the coke storage hoppers of the B range. This is of the "Niagara" quick vibratory type, and has a capacity of 40 tons of coke per hour. It is double-decked and separates to three sizes—below ¾ in., ¾ in. to 1¾ in., and over 1¾ in.

Until recently the works entrance in Birkshall Lane had only one weighbridge, over which both incoming and outgoing traffic had to pass, and there was often serious congestion of traffic. The old weighbridge has been replaced by a new one of 20 tons capacity, by Messrs. S. Parsons, Ltd., Bradford, and reserved for incoming traffic. A second weighbridge of similar make and capacity has also been installed and reserved for outgoing traffic, and a new exit built. Between the two weighbridges is conveniently arranged a new weigh office. Both machines are of the direct-reading dial type.

New High-Pressure Main.

Although all the gas is manufactured at Birkshall Works, only approximately one-third of the make is directly distributed to the district through the three town governors at this works. The remaining two-thirds is pumped direcly to both Valley Road and Mill Street gasholders for re-distribution. This procedure is necessary owing to the fact that both these stations are nearer the centre of the town and at the lowest altitude (approximately 320 ft.), Birkshall being approximately 520 ft. above sea level.

Prior to the reconstruction there was one 12-in. high-pressure steel main from Birkshall Works feeding Valley Road, Mill Street, and Idle Works. A second 12-in. high-pressure steel main to Valley Road and Mill Street Works has now been laid, thus duplicating the connexion and also enabling lower compression to convey the same quantity of gas when using both mains simultaneously. The main is of steel, 12 in. in diameter, and 3,815 yd. long: the joints are all long-sleeved and welded. The piping was supplied by Messrs. Stewarts & Lloyds who also contracted for welding the joints *in situ*, while the actual trenching and laying was carried out by the Gas Department.

The Thornton Road Works are now closed down entirely and, in order to keep the distribution system balanced as previously, a supply of gas from the high-pressure main at Mill Street is governed and conveyed along an independent main connected into the town supply mains at Thornton Road, at the point where the Thornton Road Works gas previously entered the system.

Valley Road Works.

Until 1929 gas was manufactured at Valley Road in horizontal retorts. In 1931 a Humphreys & Glasgow hand-operated carburetted water gas plant of 1·2 million cu.ft. of gas per day capacity was installed. This, then, was the only gas-producing plant at these works, although it has always been a vital storage and distribution centre. Under the reconstruction scheme the carburetted water gas plant and relief holder were removed and reinstalled at Birkshall, as previously described, and the works is now solely a holder storage and distribution station. The six original water-sealed column-guided holders were each of 740,000 cu.ft. capacity, and the oldest had been in use for eighty years. As a result of careful examinations of these holders and exhaustive tests of the holder sheeting, it was considered advisable to discontinue the use of these gasholders as soon as possible, and to build two new and larger holders in the existing tanks of Nos. 5 and 6 holders.

The old Nos. 5 and 6 gasholders were dismantled by Messrs. Clayton, Son, & Co., Ltd. Leeds, and the new holders have been built by the same firm. They are of the spiral-guided type, each four lifts, and capacity 1 million cu.ft. The tanks are 122 ft. in diameter and 25 ft. 6 in. deep. The emptying of the tanks of water prior to dismantling the old holders presented an unusual difficulty, as it was found, after lowering the water to a certain level, that considerable water was finding its way into the tank from outside. By installing heavier duty pumps the tank was eventually emptied and it was found that there was a considerable upward pressure of water below the tank base, due to underground springs. This was relieved and confined to one point by breaking through the concrete base. Pumping was resorted to night and day throughout the construction period to maintain the tank reasonably free of water. It is estimated that there was a continuous flow of at least 10,000 gallons of water per hour.

Mill Street Works.

Mill Street Works is the oldest works, and gas was made here in 1823. Gas making ceased in 1927, but the works was retained as a holder and distribution centre. In addition, since the works

is in a convenient position near the city centre, it is used as an accommodation base for the distribution staff, meter repair shop, appliance stores and repair shop, street lighting department, and the industrial staff. Distribution material is also stocked here; in addition it is the Gas Department's transport centre, where the repairs are carried out and the Department's seventeen vehicles garaged. The reconstruction provided for the dismantling of the old retort house, and the erection on the site of new and larger appliance stores, offices, and repair shop. The new building is brick-built by the Department's own staff, with steel roof and Robertson's roofing by Messrs. Wm. Neill & Son (St. Helens), Ltd. The meter shop has been considerably enlarged by converting the old auxiliary plant buildings to one large, continuous shop, with new steel-framed roof; provision is made at one end for use of the industrial section in the erection and testing of industrial appliances. In effect, the whole works has been reconstructed and the staffs reorganized to form a completely modern distribution centre, with appliance stores and workshops. The old column-guided gasholder in the Northholme Yard of the Mill Street Works was built in 1863, and had a capacity of 580,000 cu.ft. This was dismantled and a new spirally-guided gasholder was erected in the existing brick tank by Messrs. Clayton, Son, & Co., Ltd., Leeds. The capacity of the new holder is 616 000 cu.ft., and it has two lifts. Provision has been made for building a third lift at some future date.

The new 2¼ Million Cu.Ft. Spiral-Guided Gasholder installed at Birkshall Works.

Principal Contractors.

Contract.	Works.	Contractor.
2¼ million cu.ft. gasholder tank and foundation	Birkshall	Clayton, Son, & Co., Ltd.
Carbonizing plant	Birkshall	Woodall-Duckham Co., Ltd.
C.W.G. plant	Birkshall	Humphreys & Glasgow, Ltd.
Steel high-pressure main and specials	Birkshall to Valley Rd.	Stewarts & Lloyds, Ltd.
Removal and re-erection of relief holder	Valley Rd. to Birkshall	Robt. Dempster & Son, Ltd.
Foundation, relief holder	Birkshall	F.C. Construction Co., Ltd.
Water-cooled condensers (two for coal gas)	Birkshall	W. C. Holmes & Co., Ltd.
Holmes-Connersville meter for C.W.G.	Birkshall	W. C. Holmes & Co., Ltd.
Purifiers and house and demolition of old purifier installation	Birkshall	Clapham Bros., Ltd.
Holmes-Connersville compressor	Birkshall	W. C. Holmes & Co., Ltd.
Steel framing and roof for works canteen and messroom	Birkshall	Wm. Neill & Son, Ltd.
Water cooling towers	Birkshall	Davenport Engineering Co.
Two-lift gasholder (616,000 cu.ft.)	Mill St.	Clayton, Son, & Co., Ltd.
Two four-lift gasholders (each 1 million cu.ft.)	Valley Rd.	Clayton, Son, & Co., Ltd.
Holmes Connersville exhauster	Birkshall	W. C. Holmes & Co., Ltd.
Benzole washer	Birkshall	W. C. Holmes & Co., Ltd.
Two road weighbridges	Birkshall	S. Parsons & Co., Ltd.
Holmes-Connersville station meter for coal gas	Birkshall	W. C. Holmes & Co., Ltd.
Steelwork for new appliance stores and workshop	Mill St.	Wm. Neill & Son, Ltd.
Demolition of old retort house	Mill St.	G. Fort
Works mains and specials	Birkshall	Stanton Ironworks, Ltd.

New B.S. Specification for Pipes

Design of Spigot

Gas Undertakings will be interested in the publication of a revised and considerably enlarged edition of B.S. No. 78, Cast Iron Pipes for Water, Gas, and Sewage.

The previous issue had been published in 1917, but it is explained that the present revision has taken a considerable time to prepare, as investigations were necessary in addition to the carrying out of a large volume of work in obtaining the necessary information. The following are some of the outstanding features of the new issue:

A new design of socket has been standardized, the suitability of which has been thoroughly established by extensive investigations carried out both at the works of the manufacturer and also at the National Physical Laboratory. It is appreciated, however, that the immediate scrapping of all the old moulds would place a very heavy burden on manufacturers; in consequence, it has been decided to allow a time limit of five years during which manufacturers will be able to introduce the new moulds as replacements become necessary. The old design is therefore reproduced in an appendix. As the new socket is interchangeable with the old, no inconvenience will be occasioned to users by the change over.

The range of standard special castings has been considerably augmented, and it is hoped that it will now provide for all the most generally used fittings for both water and gas. In this revision it has been possible to introduce the amended requirements for testing the quality of the cast iron which have just been included in the revised edition of B.S.321—Grey Iron Castings.

In view of the extensive range of fittings that have now been standardized, the task of calculating weights is one which will take a considerable time to complete. It has been felt therefore that the publication of the revised specification should not be withheld till this information is available, as it is desired to commence the introduction of the new designs as quickly as possible. It is hoped to include the figures for weight in an early revision.

Copies of the revision may be obtained from the Publications Department of the British Standards Institution, 28, Victoria Street, S.W. 1. It should be noted, however, that as the specification is much larger in size it has been necessary to increase the cost to 5s. (5s. 3d. post free).

National Smoke Abatement Society

Conference Postponed

The Tenth Annual Conference of the National Smoke Abatement Society arranged to be held at Cardiff on Sept. 30 and Oct. 1 was postponed and will be held during November, if circumstances are then favourable.

The "All-Gas" House Drive at Newcastle

Our readers are already familiar with the very forceful campaign now being conducted at Newcastle-upon-Tyne to extend the "all-gas" house ideal. A circular letter, accompanying an attractive booklet, entitled "Let's Talk It Over!" states that the number of householders in the district who are now using gas exclusively for cooking, room-warming, and water heating has been doubled during the past six months; solid fuel has been entirely discarded from their homes. In many cases, the letter continues, this has been at no greater cost than before the conversion, while in other cases consumers find the new method to be so beneficial that they gladly pay any little extra cost involved.

"Let's Talk It Over!" is an artistic booklet containing a great deal of commonsense. It is the sort of publicity which by its very straight-forwardness is bound to make great headway. The argument for the "all-gas" house is given in the form of question and answer, and all doubts which a consumer might reasonably entertain, are disposed of satisfactorily. The questions are those which have actually been put to the Company's representatives by their consumers, and the Company believe, quite rightly we suggest, this is the simplest method of explaining the scheme.

The World Power Conference - - - -

In this article the Vienna Sectional Meeting of the W.P.C. is reviewed, and the principal points raised in those Sections of direct interest to the Gas Industry are summarized.

The World Power Conference was started after the Great War and the ideals behind it were as much the improvement of international relations as the improvement of the technique of power distribution. By bringing technical men of many nationalities together on common ground to discuss technical rather than political problems it was hoped that they would find common interests, common problems and common enthusiasms, and so reach that friendly understanding which is so necessary and yet so difficult to achieve among politicians.

The Vienna sectional meeting which began last month and ended at the beginning of this month came at a time when friendly understanding was infinitely more important than technical advances, and it is to be hoped that the delegates took home with them something of the very genuine feeling of friendliness which persisted in Vienna despite everything—even the almost continuous rain. Many of the English delegates were at first loath to go because of the unsettled political conditions, but the importance of sending a representative delegation was fully realized and 68 English delegates finally attended out of a total of 1,000 from all countries.

The following is a list of those representing the British Gas Industry, apart from Sir Harold Hartley, the Chairman of the International Executive Council of the W.P.C.; Mr. S. Lacey (Gas Light and Coke Company), Mr. H. Hollings (Gas Light and Coke Company), Mr. F. M. Birks (Gas Light and Coke Company), Mr. W. Dieterichs (Gas Light and Coke Company), Major F. J. Bywater (South Metropolitan Gas Company), Mr. H. E. Bloor (United Kingdom Gas Corporation), Dr. C. M. Walter (Birmingham Gas Department), Mr. H. G. Ritchie (Falkirk Gas Department), and Mr. J. C. Hosken (Industrial Gas Centres Committee).

The long and varied programme included besides the technical sessions extensive tours in Hungary and Austria, and visits to the Imperial Palace, Schönbrunn Palace, the Town Hall, the broadcasting station, a social welfare centre, museums, a porcelain factory, a gas-works and a power station in Vienna, Kreuzenstein Castle, the Hochschneeberg, and the Kahlenberg. Official functions included a government reception at the Imperial Palace, a banquet at the Konzerthaus, and a gala performance at the State Opera House. Not so official functions included an evening trip on the Danube, an evening at the Town Hall Restaurant (Rathauskeller), and an evening at Grinzing visiting a "Heuriger" (country wine garden).

It was singularly unfortunate that there was so much rain as this seriously interfered with the excellent arrangements made by the energetic Viennese and German hosts, who, however, were deserving of the highest praise.

The 200 technical contributions from 23 different countries and dominions represented in themselves a tremendous volume of work, and it is the work put into these Papers which forms the technical basis of the whole conference. The subject matter was divided into the following sections:

A. Supply of Energy for Agriculture.

B. Supply of Energy for Small-Scale Industries.

C. Supply of Energy for Household Purposes.

D. Supply of Energy for Public Lighting.

E. Supply of Energy for Electric Railways.

Q. Combined Papers, belonging to two or more sections (dealing for the most part with tariff questions).

Sections B, C, D, and Q were the only ones of direct interest to the Gas Industry and the following notes on these sections summarize the principal points raised in so far as this is possible in the limited space available.

SECTION B.—THE SUPPLY OF ENERGY FOR SMALL-SCALE INDUSTRIES.

The principal English Papers in this section were:

W. Dieterichs—"Gas for Small-Scale Industries."

This Paper begins by pointing out the new function of the British Gas Industry in providing a specialized heat service for industrial and commercial consumers. The object of this service, which has led to the formation of a new organization (the Industrial Centres), is "to help manufacturers to make a better product at a lower cost under better working conditions. Improving the product requires the development of improved gas burning equipment. Lowering its cost requires either a reduction in the price of gas or an improvement in the thermal efficiency of the equipment. Though the first alternative can be brought about to some extent by tariffs (discussed with examples) the second alternative provides much more scope for radical reductions in cost. Improved working conditions depend on better control of heat (*i.e.*, higher thermal efficiency) and auxiliary services (warmth, light, hot water, cooking)." The Paper describes in some detail and with many drawings and photographs the lines along which improvements in thermal efficiency are being pursued (*e.g.*, choice of burner and correct concentration or distribution of heat, combustion control, heat transfer, recuperation, insulation, new materials, maintenance, automatic control). Developments in manufacturing methods, as well as in factory heating and canteen equipment, are discussed and also tariff principles and market analysis and canvassing. A very comprehensive bibliography makes the Paper of particular interest for reference purposes.

J. N. Waite and F. H. Clough—"Supply of Electricity for Small-Scale Industries."

Mr. Waite is best known as the very energetic City Electrical Engineer at Hull, but he now has a new post with the Central Electricity Board. Mr. Clough is Assistant Chief Engineer to the British Thomson Houston Company. Their Paper begins with a rough estimate of the potential consumption by commercial and small industrial consumers. They remark that the size of this depends entirely on whether "it is an economic possibility to develop the cooking and heating demands." They make an estimate on the assumption that it is economic and arrive at a figure of 11,000,000,000 units per annum which is more than half the present total electrical output for all purposes. The estimate is made by taking the Hull area (presumably) as a "microcosm of the country as a whole" and extrapolating. They say that "it has been possible to develop considerable business in this class of demand at round about ½d. per unit for cooking and water heating, and at about ¼d. for small-scale space heating."

A section on methods of distribution describes current practice in respect of transmission and distribution voltages, voltage regulation, &c. Another on the application of energy mentions progress with discharge lighting and describes the standard types of resistor for various heating purposes and standard motors up to 5 h.p. with tables of types, prices, starting current, starting torque, speed, &c. Welding and electro-plating are also mentioned. A table giving power demands and costs for small-scale industries gives the load demand, cost of wiring installation, cost of motors, cost per unit, and percentage cost of power to turnover for a bakery, garage, laundry, &c. It will be noted that all costs per unit, except for the pottery (0·75d. to 1d.) and the bakery (0·65d. to 1d.), are over 1d. per unit or more than twice as much as the prices mentioned for cooking and water heating.

The section dealing with tariffs describes the general

principles on which equitable tariffs would be based (*i.e.*, having regard to diversity and load factor) but points out that the first essential is to find out "what must be the value to attract the business." A number of typical tariffs which have proved successful are described.

Under "Government Encouragement of Electricity Supply" the Electricity Commissioners, C.E.B., and frequency standardization schemes are described.

P. H. Herring and H. F. Jones—"Petroleum Fuels for Small-Scale Industries."

This Paper, sponsored by the Institute of Petroleum, is confined to descriptions of several industrial applications of oil burning equipment and a description of a self-generative oil burner which enables comparatively large volumes of oil (up to 5 gallons per hour) to be burnt without the necessity for an electric supply or steam or compressed air.

Among the applications mentioned are metal reducing, bell casting, crucible furnaces, aluminium melting, fritting furnaces, glass works, heating granite chips and bitumen for road work, bread baking, lacquer drying, pig singeing, and stereo-metal melting. Finally a short section is devoted to the application of propane and butane. Oil consumption figures are given in a few cases but otherwise the Paper has nothing of great interest to the Gas Industry.

J. G. Bennett—"The Supply and Use of Solid Fuels for Small-Scale Industries in Great Britain."

Mr. Bennett is the Director of the Combustion Appliance Makers' Association and is therefore in the best position to describe the work now being done to help small consumers to utilize solid fuels more efficiently. He points out that solid fuel is still the major source of heat energy for small industries, though electric power is displacing steam engines except in those special cases where it is more economical to use the exhaust steam for process work. Gas and electricity are already supplying a considerable proportion of the specialized heating load (furnaces, &c.) but little of the steam boiler load, and the position is not regarded as likely to alter during the next decade, especially in view of present developments in automatic stoking and control.

Lancashire and Economic boilers are standard practice for steam loads between 3,000 and 30,000 lb. per hour and water tube boilers for larger loads. Mechanical firing and, in larger installations, the use of pulverized fuel are doing much to improve performance and cut down smoke.

From the coal industry's point of view small industries, which absorb much of the 60,000,000 tons of coal produced in Great Britain between ¼ in. and 2 in. in size, "play an important part in balancing the demand for coals of different sizes between the domestic, railway, export, and bunker markets, which mainly take large coal, on the one hand, and the coke ovens, power stations, and large-scale industrial boiler plant, which mainly absorb the smaller sizes, on the other."

From the Gas Industry's point of view the most interesting part of the Paper is that describing the organizations now in existence to help small industrial consumers of solid fuel in the selection of fuel and plant and in its efficient running. The main bodies doing this work are the Technical Department of the Coal Utilisation Council, the Coal-Burning Appliances Joint Consultative Board working through some thirty local joint committees, the London and Counties Coke Association, and some of the leading fuel producers and distributors and appliance manufacturers. The conclusion drawn is that these organizations which have recently entered a hitherto unorganized field will do much to stabilize the market for solid fuel among small industrial consumers.

The most important foreign Papers were:

J. F. Gaskill and Constantine Bary—"Economic and Sales Problems of Electric Utility Service in the Small Commercial Market."

The sales manager and rate research engineer of the Philadelphia electricity undertaking submitted a very detailed analysis of the commercial load of their undertaking and reproduced for comparison similar figures prepared for the whole American market by the Edison Electric Institute.

The most interesting conclusions were:

(*a*) During the last ten years consumption per consumer had risen, and return per unit had fallen, but revenue per consumer had remained practically constant.

(*b*) The small commercial load (all consumers using less than 25 h.p. regardless of the size of the lighting load for other than strictly residential purposes) was about 11% of the total energy sold.

(*c*) About 86,000, or 16% of all consumers, came into this class.

(*d*) About 22% of the total revenue was derived from them.

(*e*) About 42% of these consumers did not pay their way and 78% of these unprofitable customers had less than 1 kW of billed demands.

(*f*) The large number of consumers required a large sales force while the wide variety of appliances required skilled personnel though the total revenue did not warrant high sales costs, so that the personnel was organized in two groups under unified control, one junior or service group to prepare the way, and another smaller senior group of more highly qualified men. The whole organization was backed up by direct mail advertising and co-operation with manufacturers.

Other sections of the Paper dealt with cost characteristics and rate structures with particular reference to a comparison of "block" and "demand" type rates.

C. Krecke and G. Seebauer—"Energieversorgung der Gewerblichen Wirtschaft (Supply of Energy for Commercial Purposes*)."

This Paper dealt with solid fuel, oil, gas, and electricity in Germany and, though it provides interesting statistics and a wealth of propaganda, shows a complete disregard for the limitations on subject matter laid down by the W.P.C. Committee. For instance, most of the statistics refer to the total consumptions of coal and other fuels throughout the country or for large industries such as the iron and steel industry. On the other hand, there is a good deal of interesting information to be obtained from the Paper. For instance, a table shows the numbers of bakery oven fired by various fuels in 1936; it is stated that about 8,000 large kitchens used gas at the beginning of 1937 with an annual consumption of about 4,000,000,000 cu.ft. per annum.

French National Report (Thuillier)—"L'Energie dans la Petite Industrie (Energy in Small-Scale Industry)."

This general report begins with statistics showing the numbers of small industrial concerns and the numbers of people employed in them. A fairly detailed review of their power requirements is given, but this is not of much importance to the Gas Industry.

It is stated that out of the total French sales of town gas of 47,000,000,000 cu.ft. (rather less than those of the Gas Light and Coke Company) 5,400,000,000 cu.ft. were sold for commercial purposes, 2,300,000,000 cu.ft. of them for large kitchens.

A section on tariffs gives details of typical block rates for gas and mentions that in almost all districts except Paris and its suburbs the peak load occurs in the summer and not in the winter. In dealing with sales problems details are given of a central heating campaign by a gas company in the Paris district. In 1936 there were in the area 24,297 solid fuel installations, 212 oil, 3 electric, and 79 gas. A special low tariff for gas was introduced with disappointing results due to the cost of new equipment. A cheap conversion set was then devised with the result that 800 installations were converted in 1937 and at the beginning of 1938 there were more than 1,000 orders waiting to be executed.

Dealing with State assistance and intervention it is mentioned that though the State has done much, for instance, to encourage the provision of electric supplies throughout the country, it has to a great extent nullified the use of this by high taxation on current and fuel supplies. An example which will interest Englishmen who complain of the British

* Literally "Commercial Industry."

tax on oil is that the tax on oil is more than 1,500 frs. a ton, which means about £12 at the standard rate of exchange.

M. Marlio—"Emploi du Gaz dans la Petite Industrie proprement dite (Use of Gas in Small-Scale Industry)."

Details are given of a survey by the Association Technique du Gaz which show that 3¼% of the total French sales of gas are used for small industrial purposes. The number of meters is 0·54% of the total and the average consumption per consumer 93,000 cu.ft. per annum, or nine times the average per domestic consumer. Only one small industrial concern in 15 has a gas supply at all, so that there is plenty of room for expansion in this market. Practically no gas lighting remains in workshops, but there are about 23,000 kW of gas engines remaining.

A survey of new small industrial consumers in Paris showed that their average load factor was about twice that of the average domestic consumer. Larger industrial consumers working to prescribed hours had generally a much lower load factor.

Dealing with propaganda methods the Paper points out that personal contact is the only satisfactory method and supports this with statistics showing the tremendous rise in average consumption registered by those consumers visited by the "Service des Applications Industrielles" of the Paris Gas Company.

The M.o.T. Final Report on Street Lighting

We give below a report of the discussion which followed Mr. J. F. Colquhoun's Paper on this subject before the Bournemouth Conference of the Association of Public Lighting Engineers.

Mr. G. F. GREGORY (Ilford) said that personally he believed the tendency would be to increase the height and spacing of street lamps which would have advantages both from the point of view of efficiency and economy, for future progress would depend on the cost per mile. Mounting heights would probably be something like 35 ft. with spacings of from 250 to 300 ft. In this connexion he remarked that it might be advisable to take an example from nature which certainly did not provide a large number of light sources spaced closely together at not very great heights. In that respect it would have been well if the Ministry of Transport Report had visualized the possibility of a future trend in the direction he had mentioned. The very fact that the Report laid down a more or less standard arrangement was rather a weakness tending to stultify progress and it was to be hoped that the Ministry would undertake energetic research in this connexion which would cancel out any sterilizing effect which might be produced by standardization. Referring to bends he deprecated the possibility of a forest of posts at a sharp bend and also complained of too many posts in our present methods of lighting dual carriageways. In the case of comparatively sharp bends it should be possible to avoid alternate lamp columns by making use of a catenary wire suspension which would give an overhang of something like 6 ft. where the radius of the curve was about 40 ft. This would also serve to economize in capital expenditure and also in servicing the installation.

Mr. E. C. LENNOX (Newcastle-on-Tyne) remarked that a Committee of the British Standards Institution was now dealing with a standard specification for street lighting which would shortly be published. He disagreed with the policy of lighting dual carriageways as two separate roadways as this involved the use of too many poles from the æsthetic point of view and did not conduce to economy. The main aspect of this matter, in his view, was the administrative one and he felt that the Report of the Committee which took 2½ years to prepare and was the result of deputations from all over the country, would be of very little use unless some new administration of public lighting was introduced into legislation on this matter. He had gone into the question of the cost of carrying out the recommendations of the Ministry of Transport Committee and had found that whereas in large cities the cost of conforming with the recommendations might be 0·3d., 0·4d., or 0·5d. in the £ of rates, in small towns it would be as much as 3d., 4d., and 5d., and in the more remote districts as much as from 1s. to 2s. 6d. in the £ on the rates. It was impossible, therefore, to cater for lighting on the scale recommended without assistance and this fact had been brought to the notice of the Ministry and was being followed up by the Association. Personally, he felt that street lighting was being relegated to the background whereas it should be regarded as part of ordinary highway costs. It had been estimated that it would cost £3,000,000 to £5,000,000 per annum to carry out the Ministry's recommendations which was quite beyond the bulk of the local authorities concerned, but in his view the money could be obtained if account were taken of the reduced accidents per annum, and the cost they involved, and secondly, by the imposition of a tax of 5s. per annum on bicycles. Furthermore, it would never be possible to get the standard of lighting set out in the Report so long as the Ministry of Health had control only over those schemes which necessitated loans. He had recently had to deal with many schemes which had taken some two years for the Ministry to grant a loan whereas actually the schemes could have been carried out within three weeks. In his view public lighting both as regards construction and maintenance should be a matter for the Ministeries and it should not be necessary for gas and electricity companies to have to put up capital and provide competitive schemes which, as a result, were cut to the bone.

Mr. C. H. DOBELL (London) said that one of the most important things in the Report which, however, was not mentioned in the Paper, was the hours of lighting. The Report stated that street lighting should be on from dusk to dawn and not from sunset to sunrise, which was a very different matter. From this it followed that street lighting must be controlled in every individual street. In many towns there were narrow streets, high buildings, and a smoky atmosphere, on the one hand, and broad and light streets on the other in the daytime, and it was not fair to the people living in the narrow dark streets that they should have to wait for their artificial street lighting until the people in the wider and lighter streets got theirs. There was only one way of dealing with that problem, and that was by the use of light actuated switches.

Mr. J. H. BURMAN (Hendon) said that no difficulties were experienced with single bends; it was the double or S bend which caused the trouble. In his view, in such cases there must be overlapping of the lamps—*i.e.*, the lamps must be on both sides of the road at the junction of the two bends, and that was covered by paragraph 47 of the Report. He enquired if that was the correct interpretation of the recommendations.

Mr. J. A. PROWSE (London) expressed the view that the recommendations for lumens output per 100 linear ft. should not be regarded as a maximum and added that the Report itself made this clear. However, there had been cases in which, in order to get the job on the question of price, lanterns had been submitted which at their maximum light output when new would only just reach the minimum of 3,000 lumens per 100 linear ft. and in actual practice when the lamps had deteriorated somewhat, this minimum output could not be maintained. Speaking with regard to the lighting of roundabouts, he said that quite frankly he was a little scared and attention should be given to the lay-out of the roundabout so that the lamps could be placed on the outer curve and thus avoid all the light being concentrated on the roundabout itself as was too often the case now. In his view the recommendations in the Report could only be regarded as suitable for roads as they existed to-day and it was necessary to contemplate increasing the scale of illumination as roads became bigger.

Councillor H. A. BENWELL (Bournemouth) said that although public lighting authorities welcomed the Report of the Departmental Committee it was the fact that the Committee did not contain any member representing those who bought public lighting although it contained many who made and sold equipment. He complained that the Report dealt principally with main roads but 80% of the population lived in narrower roads and it was not right that they should have to put up with very bad lighting. He also complained that grants were only to be made for trunk roads and not for other roads in county boroughs where, he said, the cost of lighting represented 36% of the total cost of maintenance.

Mr. W. E. GREENHALGH (Bury) suggested that it was not so necessary to measure the illuminations on a roadway as the darkness of a roadway and urged that greater attention should be given to the diversity factor in street lighting. It should be possible for motorists to travel at 30 miles per hour in built-up areas without passing continually from well lighted roads to less well lighted roads and extremely badly lighted roads. While that state of affairs existed it would not be possible to eliminate accidents. The tendency at the present time on the part of manufacturers, he said, was to make miniature searchlights and to throw an intense illumination on a given spot. The result, in terms of average candle-power, in his view, was absolutely fictitious and he urged manufacturers to provide equipment which would give more uniform illumination over the whole of the road surface.

TRADE NEWS

What the manufacturers are doing by way of new and improved appliances, plant, and processes.

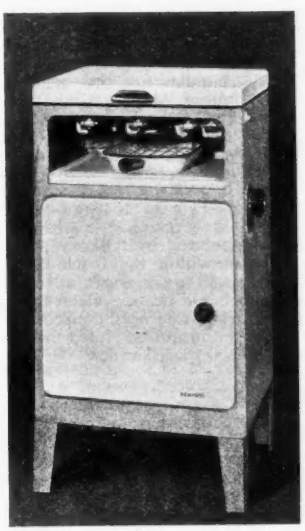
Pressure and Vacuum Recorders and Indicators.

The types of plant which require a knowledge of pressure conditions are almost innumerable, runs the foreword of a recent publication by Alexander Wright & Co., Ltd., manufacturers of Simmance patent "Dead Beat" pressure and vacuum recorders and indicators. Chemical processes and combustion methods may be said to enter into many manufacturing schemes where a knowledge of pressure and vacuum conditions is essential to efficient control. The catalogue covers particulars from which may be selected forms of gauges for all purposes, from high-pressure indicators and recorders to instruments showing minute variations in pressure. The firm has been dealing in specialities for the indication and recording of *plus* and *minus* pressures for over ninety years, and the number of designs produced by them for what are claimed to be novel purposes has been very large. They have built up a reputation as "the firm to go to for anything required for a special purpose."

New Stoves, Ltd., Developments.

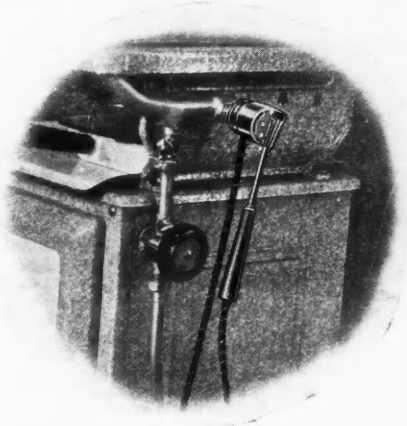
It is always interesting to welcome the appearance of new appliances by Stoves, Ltd., because they are certain to incorporate a number of novel features. Their recently introduced streamlined "Newhome" gas cooker is no exception and marks a definite advance on anything the firm have hitherto produced on these lines.

The "Newhome" has exceedingly neat and pleasing lines, offering no dust or grease traps with its folding hotplate cover, rounded mouldings, and concealed supply pipes. The finish is in attractive light grey mottled enamel throughout, with the exception of the oven door panel, crown plate, and cover, which are white. The crown plate can, if desired, be dispensed with entirely as the enamelled oven top on which it rests is itself recessed in a trough in front and beaded round the other three sides to make a liquid-tight permanent crown plate. The hotplate consists of two boiling burners and the "Duex" reversible grill-boil burner with the well-known circular griller. Although every encouragement is given to make full use of the griller, the circular fret can be readily lifted out, leaving an additional high-speed boiling burner. The hotplate bars are removable in two complete sections for easy cleaning. Taps are of the standard pattern recessed below the cornice. The hotplate cover can be raised and locked in position in a single movement; similarly, an alternative plate-rack or white enamelled shelf can be set in position—both operations requiring one hand only. Heavy mouldings lock the rack in place, while rubber stops prevent the cover from scratching the enamelled cornice.



The oven is roomy, with either single or twin burners and top flue outlet—automatically controlled by means of the firm's "Autokook" thermostat. The sides of the oven are embossed to carry the grids, which travel very easily and smoothly. Studs are provided to maintain the grids in a horizontal position when they are drawn forward from the oven. The oven door hinges are fitted internally so as not to break the smooth continuity of the outside surface, while the door is, in addition, self-latching, requiring merely to be pushed to in order to close firmly.

An interesting accessory which has been recently introduced by Stoves, Ltd., in connexion with their cookers is an improved lighter. The firm have been experimenting with automatic ignition devices for more than ten years, with the result that they have behind them valuable experience in various mechanisms. The efficiency of cooker lighters has in the past been impaired by the settlement of dirt and grease on the working parts, where proper cleaning has been difficult. In this new lighter such an obstacle has been overcome by totally enclosing the mechanism in a chromium-plated casing. The handle of the lighter when in the off position hangs slightly forward—at 15° from the vertical—thus allowing a safety margin for the complete shutting off of the gas supply. The raising of the handle turns on the gas, while withdrawal causes the head of the lighter to pull back a spring-actuated flange, the release of which produces a strong spark to ignite the gas at the head of the lighter. On replacing the head, the handle drops back to the off position again. A spring operated pivotal arm holds the standard cylindrical flint in position and enables it to be replaced very easily when worn down. This lighter has now been under test since the beginning of the present year and has shown itself to be robust in construction and capable of standing any amount of rough usage. The lighter is readily fitted to all types of gas cooker. In the case of Falk's cookers the supply rail is specially tapped on the right-hand side so that the lighter merely needs screwing on. On other types it can easily be fitted underneath the cornice on either side.



Water Heating Literature.

The use of gas for firing hot water supply systems, state Messrs. Thomas Potterton (Heating Engineers), Ltd., practically commenced with the introduction of "Victor" gas fired boilers nearly 40 years ago. This proving so advantageous, its use advanced to central heating and it is now used to such an extent that gas claims consideration for installations of every size.

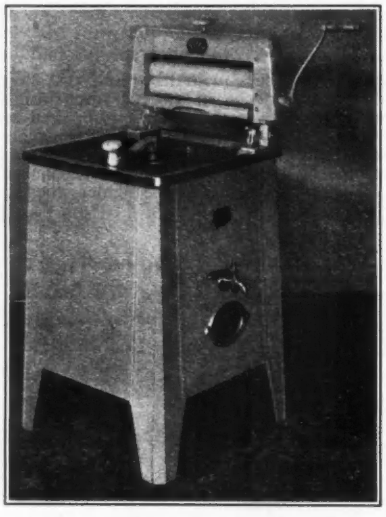
To consolidate the position thus gained and to keep abreast of progress in hot water engineering, it is essential to ensure that the boilers used are of a simple, reliable, and efficient type. To illustrate some such boiler plants of interest, and to show the extent of their capacities, the firm have prepared a most informative brochure. This reviews some of the larger boiler installations, but there are over 50,000 smaller Potterton boilers in use. Single units are available for hot water supply in various capacities from 22,800 B.Th.U. to 198,000 B.Th.U. per hour or for central heating from 16,000 B.Th.U. to 1,250,000 B.Th.U. per hour. In submitting these catalogues attention is drawn to the variation in price of the automatic cut-off for the "Empire" and "Emperor" heaters. The automatic cut-off for these units has been re-designed so that the valve is within the brass work and not within the cast-iron burner. This has made it easily accessible, and the permanent pilot is connected to the thermostat complete, leaving only one connexion for the gas.

A new factory site which the firm bought early this year at Wandsworth is now being covered and, failing any untoward events, the works should be completed by the middle of December.

TRADE NEWS—(*Continued*)

Additions to "Jiffy" Range.

Additions to their range of wash boilers are announced by the Jiffy Automatic Clothes Washer Company, Ltd. These include the entirely new streamlined gas-heated model.



"Jiffy" Streamlined Gas Washing Machine.

This appliance, which has been expressly constructed to meet the requirements of all gas undertakings is built with a large capacity tinned copper tank, aluminium lid, and a superior galvanized pressed - steel skirting. Chromium turn buttons and outlet tap, combined with the adoption of entirely new shades of blue, green, and grey enamel give this washing machine a very handsome and elegant appearance. In addition to the above what is claimed to be a novel type of wringer fitting is being used, ensuring great facility both in fixing and in operation. The manufacturers are confident that this new product will meet with a ready demand, and the new machine is priced at an attractive net figure.

Felco Hoists, Ltd.

An illustrated leaflet published by Felco Hoists, Ltd., gives details of their "Felco" short headroom steel triple gear chain blocks. A study of the brief details in the leaflet show that these pulley blocks possess many important features, and headroom and weight have been reduced to a minimum, while strength and safety have been increased to a maximum. Every block is tested to 50% overhead working, and 100% overhead static, and a test certificate is issued with each block.

An Attractive Portable Heater.

In our review of the exhibits at the recent Building Exhibition at Olympia we made passing reference to an interesting new portable heater by the Parkinson Stove Company, Ltd. This is the "Zonette"—an attractive little appliance which is strongly constructed yet light in weight—incorporating the "heated element" principle. Small gas jets impinge upon this element which is composed of special alloys, and the radiant heat is collected by the reflector and directed into the room in a forward beam of glowing warmth. To render the "Zonette" an ever-ready source of heat a reliable self-lighting device is incorporated whereby a movement of the control switch operates the Parkinson flint lighter, instantly igniting the heater. A useful additional feature is provided in the form of a boiling trivet above the heating element on which a kettle can be safely rested. The dimensions of the heater are 12¾ in. high, 13$\frac{7}{16}$ in. wide, and 6$\frac{5}{8}$ in. deep over the feet. The "Zonette" is finished in satin silver, and the gas consumption is stated to be 9-11 cu.ft. per hour, equivalent to 4,500 to 5,250 B.Th.U.

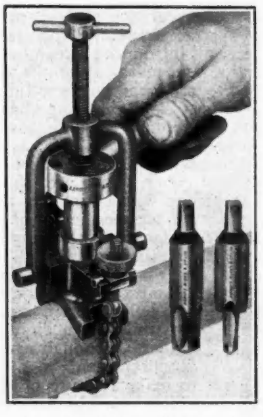
"Wask" Raising and Lowering Lighting Gear.

The "Wask" patent lamp raising and lowering gear is claimed to meet all requirements of modern street lighting, either for Class A or other roads, there being arrangements, described in a catalogue recently published by Walter Slingsby & Co., Ltd., to suit suspension lamps of all heights and overhangs using high or low pressure gas. In the course of this publication the makers state that the system possesses the following advantages. A saving in maintenance naturally follows when lamps can be lowered to ground level for their regular cleaning or in case of individual failures; one man can do the job, the gas supply always being connected. The efficiency of the light source is maintained at a maximum by the gas supply remaining connected when the lamp is lowered, enabling correct adjustment to be made. Safety is assured to both attendant and the users of the road, as the former works at the kerb and the latter do not have to dodge ladders. Convenience, the makers conclude, sums up the "Wask" advantages; lamps can be attended to at any hour of the day or night without trouble or special staff. Many illustrations and diagrams are included in the catalogue.

"Nife" Alkaline Accumulators.

Readers of the "JOURNAL" will be able to obtain a copy of a comprehensive booklet dealing with "Nife" nickel cadmium alkaline accumulators free of charge on application to Batteries, Ltd. This interesting booklet contains much useful information regarding the "Nife" accumulator.

Miniature Drilling and Tapping Machine.



No. 02 Pocket Machine in Operation.

Owing to the cost of inserting tees for pressure points and additional heaters, refrigerators, &c., and to the increasing prevalence of gas undertakings to adopt an "all-in" supply, of such a device as the new "Abbirko" No. 02 miniature drilling and tapping machine is definitely needed. It is suitable for drilling and tapping ¼ in. to 4 in. tubes with ⅛ in., ¼ in., and ⅜ in. B.S.S. pipe threads. By using this handy pocket machine, the expense of disconnecting, cutting out, screwing, and supplying a new tee is obviated. It is claimed by the manufacturers, Abbott, Birks, & Co., Ltd., that the job is done *in situ* in five minutes; the machine drills and taps in one operation.

A New Portable Heater.

The New "Truff" Gas Fire manufactured by "Bland" is not only very attractive and reliable, but within the reach of any pocket, and is a very satisfactory answer to the much advertised electric portable fires. It has a detachable heating element with a guaranteed life; it is fitted with a regulating needle ejector and silently consumes 12·5 cu.ft. per hour. Chromium plated throughout, the "Truff" presents a very pleasant appearance.

A "Luxury" Type Gas Poker.

To meet the demand for a "luxury" type of gas poker at a popular price, Messrs. William Edgar & Son, Ltd., have lately developed the "38" gas firelighter in colour. The blade is of specially tempered steel to give long life and is now interchangeable with the Edgar No. 1 poker. The handle is of bakelite and may be obtained in red, green, or black. The firelighter can be used with either the British Standard flex plug and socket or rubber push-on connector.

Architects' Specification Book.

We have received from Messrs. Donald Macpherson & Co., Ltd., a copy of their new Architects' Specification Book. This is put up in a simple form so that architects, clerks of works, &c., can quickly get at specification details without having to wade through a lot of advertising matter. While this little booklet may more directly concern the decorating trade, it has occurred to us that the engineers of many large works would care to have copies by them, to help in getting out particulars for the re-decoration and maintenance of offices, showrooms, messrooms, &c.

Calorific Value Standards

In the Editorial Notes in our issue for Aug. 10 we commented on the Paper given by Mr. John Keillor, of Vancouver, at the recent International Engineering Conference in Glasgow. In regard to these comments Mr. Keillor has kindly written to us expressing his views on the subject of calorific value standards.

"The subject of calorific value has always been a contentious one in Canada. It is difficult here as in Great Britain to get unanimity of opinion on the subject because of varying types of plant in use and other variables. I have myself for years been an advocate of making and selling gas in the lower C.V. brackets rather than the high because I have proved to my own satisfaction that efficiency of gas in use in present day consumers' appliances increases with reduction in the C.V. But where is the point of maximum efficiency?

"Will 'efficiency of gas' in use not ultimately be the determining factor in the selection of the C.V., granted that a Company has the flexible type of plant which can produce the most efficient gas cheaply and a distribution system that can deliver it to the consumer in adequate volume? If the answer is 'yes,' then some of the C.V.'s in Great Britain and Canada are too high.

"I envy the British Gas Industry its freedom to choose the C.V. it will make in any city, or should I say freedom to manufacture and distribute the most efficient B.Th.U. irrespective of calorific value; B.Th.U. with the highest possible flame temperature; high flame speed B.Th.U. I envy the flexibility British gas companies enjoy in the matter of selecting manufacturing processes which as the years pass would seem to call for more mechanical and chemical engineering skill on the part of those who make the selections. I wish gas companies in Canada had similar freedom.

"If the tendency is for greater uniformity of calorific value in Great Britain I hope the reasons therefore are commercially as well as scientifically sound. Some of the Papers I have read recently give the impression that the Industry in Great Britain is contemplating a retrograde step. There must be a great many opinions as to the advisability of limiting C.V.'s to greater uniformity. It seems to me looking from the outside that if 844 undertakings have been able to conduct their operations successfully using 28 different C.V.'s, that number was not too many during the few years the Industry has been developing a new technique in manufacture and utilization.

"Progressive changes have taken place in methods of manufacture and utilization since the Gas Regulation Act came into being, and when one recalls the amount of research work done in the meantime and the experience accumulated of making and selling gas between the range of 200 to 600 B.Th.U. it will be interesting to know if, as a result of that experience, the Industry in Great Britain is going to put minimum and maximum C.V.'s in the regulations where there are none now.

Industry Should Move Slowly.

"A new technique in gas manufacture and utilization is in the making. For this reason I think the Industry should move slowly in the matter of restricting the B.Th.U. range. The 28 different C.V.'s are the result of 18 years' experience, not a long time after all for an Industry which necessarily takes years to adjust itself to the advantageous changes made possible by the Gas Regulation Act, 1920. I do not think the Industry has exhausted its opportunities for beneficial change to company or consumer under the new system.

"Further research and enquiry will doubtless teach still more about the new technique than we know now. If I had my way I would leave the range of C.V.'s as they are for a while and carry on with research, perhaps until after the economic enquiry suggested by Sir Frederick West has been conducted. I hope the Gas Industry in Great Britain sees fit to institute such an enquiry.

"It is pretty generally known now that flame temperature increases with decrease in the content of hydrocarbons, that the higher the C.V. of town gas the lower its efficiency in use. Then why are we not laying more stress on 'efficiency of gas' in use? If in Canada in future we plan to make gas that will produce maximum efficiency in use in present-day appliances we can select manufacturing units in which we can make cheaper and more efficient B.Th.U. from local raw materials no matter whether it be coking coal, non-coking coal, or oil, &c. We can prescribe and make a composition of gas most economical and efficient for local requirements, plan the future distribution systems, and design if possible more efficient burners so that we may in turn select the most efficient C.V.

"The competition of electricity, oil, sawdust, &c., is so keen in Canada that we are bound eventually to plan to make the gas of the future as efficient in use as possible even if we seem to be a little disrespectful of calorific value. Don't you think it should be left to each company in Canada, as in Great Britain, to select its own C.V. consistent with giving the consumer the most efficient gas it is possible to make from available coking or non-coking coals or oil? I believe the progress of the Industry in the Dominion in recent years has been retarded by our lack of liberty to do the things.

"I agree that we must look at the matter also from the point of view of the manufacturers of gas-making plant and of gas-using equipment. Progressive gas companies are always directing their efforts towards making cheaper and more efficient B.Th.U. Gas plant manufacturers are continually improving gas making plant. Gas-using equipment manufacturers continue to improve the appearance and design of gas burning appliances and to make more efficient burners. It is becoming more necessary to synchronize these three efforts and to adjust the manufacturing process to the urge of competition for more efficient gaseous B.Th.U. and more efficient burners. Each is inseparably linked with the other.

"I suppose we will always have complete gasification plants, low temperature distillation plants, horizontal retorts, continuous vertical retorts, intermittent chamber ovens, coke oven plants, C.W.G. plants, &c. The gas engineer does not lack diversity of processes from which he may make a selection. But does not the efficiency or otherwise of any one of these processes in a gas-works or a combination of two or three of them affect the selection of the most efficient C.V.? In some locations it may not be possible to prescribe and make the composition of gas most efficient in use if a company does not have the right kind or combination of manufacturing units. Some companies may be unable to make the composition of gas most economical for the locality because they have old type inefficient plant and some won't change until they are well nigh compelled to do so by some circumstance or other. Some complain that the mains are old and too small and won't stand more pressure. Some are afraid of excessive leakage and so on. Such companies will very likely prescribe a fairly high C.V. They will sacrifice 'efficiency of gas' in use for some other consideration or considerations, and that would be their privilege under the Gas Regulation Act. But their decision for the time being is not necessarily in the best interests of the companies or their consumers.

"The C.V. range that can be manufactured in any of the available C.W. gas or coal gas-blue gas plants using steam or no steam is wide enough to provide a constant supply of from approximately 350 B.Th.U. to near 600 B.Th.U. gas and from about the same low range to higher than 600 B.Th.U. if the C.W. gas or the intermittent chamber over three-stage coal gas, blue gas, C.W.G. processes are used to control coke production. This is a wide enough range to supply all of the 28 declared C.V.'s except a very few in the lower than 350 B.Th.U. class. For the latter the declarant may have to use another type of plant or combination of two. But in view of the possibility that gas companies may make in future more gas prescribed to produce maximum efficiency or near maximum efficiency in use in consumers' appliances, it is fortunate that the Industry is so well served by the plant manufacturer and can select well designed, diversified types of plants and processes to make the lower C.V.'s if maximum efficiency in use is found to be in the lower C.V.'s.

Tendency Towards Complete Gasification.

"I do not see that the plant manufacturer would be affected much, if at all, by a return to greater uniformity of calorific value. But a return to greater uniformity might ultimately reduce the number in use of low C.V. processes and thus defeat the purpose of the Gas Regulation Act. I believe there will be a tendency in the future towards complete gasification of coal or a process that can control the production of coke in districts where cheap non-coking coals are available for making gas or where it is difficult to market coke. The Industry in certain districts is not going to use for ever coking coal if cheaper non-coking coal is available for gas making in efficient complete gasification plants. In such districts special processes must, of course, be selected and a C.V. declared that is the most efficient in use. Liberty in the selection of plants and C.V.'s in such cases is one of the great privileges conferred by the Gas Regulation Act—a privilege which I should think the Industry with divers opinions will not unanimously give up.

"The time is coming when it will be more difficult to sell coke or solid fuel of any kind. The public are becoming more automatic heat conscious and are turning to gaseous fuel or oil to

escape shovelling coal, coke, and ashes. They are turning very rapidly in the United States and Canada. Manufacturers are solving their fuel problems by turning to gas and oil. The Gas Industry, whether it likes it or not, must prepare for this gradual transition from solid fuel to gas. Don't you think we should gradually get ready to prescribe and make the kind or composition of gas that will produce maximum efficiency in use in consumers' appliances, soft pedalling on the C.V.? The new technique will probably develop a new standard of value of gas. Calorific Value is, I think, becoming a misnomer. Calorific value alone is an indeterminate measure of value of gas. To say to-day that a gas contains 450 B.Th.U. without also stating what its chemical composition is reminds one of how we used to say a few years ago a gas was 16 candle power without also stating what its B.Th.U. content was.

"You say—'There is no doubt that the Gas Industry's activities will have to be regarded from the service angle—the satisfaction of the consumer with a trouble free heat service. As things stand at present the manufacturers are forced to provide gas and air adjustments to cover wide ranges in calorific value.' I agree but would like to observe that the manufacturers of gas-using equipment have always with few exceptions since the days of the bunsen burner been required to provide gas and air adjustments to cover fairly wide ranges in calorific value and candle power. Just what range of C.V.'s can satisfactorily be used in well designed gas-using burners equipped with good air adjusters and interchangeable nozzles

"There will be unsatisfactory appliance performance if burners are equipped with a fixed side of nozzle or orifice and a poor type air adjuster or no air adjuster at all, but if the burner is equipped with an interchangeable nozzle and a well designed air adjuster an ordinary consumers' burner will work quite satisfactorily on a wide range of C.V.

"I recently discussed this phase of the subject with Mr. R. M. Conner, Director of the American Gas Association Laboratory at Cleveland, Ohio, who has had more experience of wide range C.V.'s than probably any other man in America, and he tells me that all of the 'Approved' burners (and there is very little else being sold in the United States and Canada now) equipped with well designed air adjusters and interchangeable nozzles will perform satisfactorily on a range of C.V.'s from about 300 to 1,100 B.Th.U. (manufactured gas to natural gas) providing the gas is supplied at sufficient pressure. For higher B.Th.U. gases such as butane or bottled gas (over 3,000 B.Th.U.) it is advisable to use a specially designed burner.

"Our own experience in Vancouver using burners with well designed air adjusters and interchangeable nozzles is that when making tests with variable C.V.'s from about 350 to 575 B.Th.U. no difficulty is experienced if the adjustments are properly made. A temporary violent change in C.V. and specific gravity would surely give trouble, but this is not likely to happen in a city where there is a fairly uniform C.V. supplied.

"I do not think the Gas Industry or the manufacturer of gas-using equipment has much to fear from the continuance of a fairly wide range of C.V. if burners are equipped with well designed air adjusters and interchangeable nozzles or with no air adjusters at all if the C.V. is very low. Eventually I think manufacturers of burners will be making at least three 'approved' types if they are not doing so already. One designed for high C.V. bottled gas with air adjusters, another equipped with well designed air adjusters and interchangeable nozzles for a C.V. range from about 300 to 600, and a third for the very low C.V. gases."

A.R.P. of Gas-Works Plant

Thoughts After the Crisis

By R. J. RESTALL

The thoughts which have passed through our minds during the past few weeks and the visions of shattered plant and disrupted services will, it seems likely, have no little influence, generally, on the future form of construction of all buildings and engineering works. The aspect of the manner of design, construction, and layout of gas-works is more vitally important, of course, to the Gas Industry than general constructions, and therefore the present short article deals particularly with considerations for the future protection of gas-works plant.

To a large extent the present comparatively flimsy buildings, that is, 4½ in. brick filling in steelwork frames, could well be replaced by the good old solid retort house buildings that were the vogue about 40 or 50 years ago, and in addition it would be a distinct advantage to have coal storage in close proximity to at least one wall of the house. While it is recognized that coal is inflammable, it seems also that it may be put to good advantage in several directions without causing unnecessary risk.

Future Design.

While on the face of things it does not seem possible to protect fully the whole of a gas-works from aerial attack, there are many sections and various plants which could have such layout as would shelter them from all but the most severe part of such attack, or direct hits from heavy high explosives. Flimsy brickwork, windows, and light roofings would, it is thought, be complete debris after an aerial attack, due not so much to being hit by bombs as to the concussion from nearby explosions. The light type of sloping roof could well be replaced by flat reinforced concrete sufficiently strong to support varying depths of sand or earth, according to the value or importance of the plant below.

The future must hold for us definite ideas of installing plant bearing in mind the possibilities of aerial attack, and with this still in view cables, mains, and services, which during the past few years have had a tendency to be fully exposed, would again go below ground, where, if they are buried sufficiently, a certain measure of protection is afforded. Further, the underground storage of liquids and the underground installation of important machinery like exhausters, generating plant, feed pumps, boosters, and so forth, although costly, would ease one's mind during war time. Over such underground installations the stacking of several feet of coal or coke would be advantageous—preferably coal, as in the case of serious explosion and dispersion of such protective material coal is the least injurious to machinery and instruments.

The designers of instruments might well have in mind the difficulty of decontaminating small delicate articles such as temperature recording instruments, calorimeters, and the like, and therefore the outside cases could be made exceedingly plain with flat surfaces, and positively gas proof. In this connexion, if the buildings housing such instruments were not underground and not splinterproof, they should at least be gas proof, and such buildings consequently would be airtight, therefore a forced type of ventilation would be a natural corollary. It is contended that this move would be in parallel with the present trend of air conditioning in modern buildings, and in having windows which would not open and air locks at all entrances and exits the idea of air conditioning is only being extended to that of gas proofing as well.

Gas-Works Fifty Years Hence.

The purification plant and storage of gas present the greatest difficulties. In the first case, the underground installation of purifiers would be exceedingly costly. Most up-to-date layouts favour overhead purifiers, such purifiers presumably being of the oxide type and requiring a large area, costly valves, and connexions overground. This entirely defeats the suggestion of laying all connexions well below ground, and therefore from this one's mind passes to new forms of purification plant which would require less ground area. On the question of the storage of gas it does seem that the older type of water-sealed gasholder, the water being contained in a masonry or concrete tank below ground level, has decided advantages, but except for an increase in much smaller holders of the high-pressure type there does not seem much prospect of eliminating this source of danger to adjacent plant and surrounding buildings.

The isolation and careful planning of chemical manufacturing plant would be advisable, and the storage of benzole, for instance, in underground tanks seems indicated.

All the foregoing definitely points to an increase in the cost of manufacture and running, since such items as drain-

age, pumping, lighting, and air ventilating would obviously cost more. The introduction of plant to gas works such as has recently been under discussion, that is, complete gasification plants and high-pressure work, although much more costly than the existing type of plant, would tend to concentrate production within much smaller areas. Such plants would, therefore, presumably not be so difficult to protect as the large bulky ones now in common use. Following this concentration of gas manufacturing plant, it is almost certain that the concentration of other plant would follow, and in the all-gas future the bulky and costly plant necessary for handling and storing coke would be done away with. Small units for the various processes would replace the larger ones, and one imagines the layout of a gas-works in, say, 50 years' time as being very different from the present day.

The whole subject has only been touched upon very lightly. With a little thought our own individual problems can be easily tackled.

Gas Undertakings' Results

Abertillery.

Reference to the increased cost of coal is made in the report for the twelve months to March 31 of the Abertillery Urban District Council Gas Department, and it is pointed out that the new agreement controlling the supplies of coal demands that deliveries are made in equal weekly quantities throughout the year, with resultant increased handling charges. The gas sold and used on works, at 81,129,344 cu.ft., shows an increase of 10·3% when compared with the previous year, and there has also been some decrease in the unaccounted-for figure. There were at March 307 ordinary consumers and 4,596 prepayment; while the average consumptions during the year were 47,501 cu.ft. per ordinary consumer and 11,819 cu.ft. per prepayment consumer.

Brisbane.

The Brisbane Gas Company reports a profit of £30,113 for the half-year ended June 30, compared with £31,730 in the previous half-year, and £26,293 in the corresponding six months of 1937. Dividend at the rate of 7% per annum absorbs £26,468. A further increase of 1s. per ton in the price of coal as from Jan. 3 was notified by the West Moreton District Coal Board, against which the Company unsuccessfully appealed. The Company has appealed against the new quotas for the supply of coal from July 1 on the ground that it has been deprived of suitable supplies.

Cleveland.

The Cleveland Gas Company submit their accounts to the shareholders half yearly, and for the six months to June 30 last the Directors report a profit of £512, to which falls to be added an amount brought forward of £2,836. Out of this they propose to allocate £350 to reserve for repairs to plant and £100 to the Contingent Fund (making it £10,000). This will leave the sum of £2,898 to be carried forward. The gas sold in the six months was 12,967,600 cu.ft.

Coatbridge.

A satisfactory statement of accounts and balance-sheet for the year ended June 30 are submitted by the Directors of the Coatbridge Gas Company. Sales of gas for the twelve months amounted to 1,513,530 therms, the receipts for which totalled £54,256. The capital expenditure during the year was £8,964, of which £4,100 was on carbonizing plant. The Profit and Loss Account shows a sum of £14,998 brought from Revenue Account, and a balance of £9,210 applicable for dividends. The Directors recommend the payment of final dividends at the rates of £9 5s.% actual on the original stock, and £6 9s. 6d.% actual on the four issues of £10 shares. The interim distribution last February was at the rate of 5% actual on the original stock and 3½% actual on the new shares.

Colonial Gas Association.

The report for the twelve months ended June 30 of the Directors of the Colonial Gas Association, Ltd., whose head offices are at Melbourne, Australia, states that the net profit for the year is £78,104, and that with the balance brought forward the profits available are £103,468. The dividend for the year on the ordinary shares is 6%, Australian currency, the sum of £3,000 is transferred to the Reserve Fund and £5,000 to the Renewals Fund, which leaves a balance of approximately £25,212 to be carried forward to the next account. The business of the Association is expanding in a gratifying manner, the quantity of gas sold during the year showing an increase of 7·9% over those of the preceding year. The increase in sales of gas for the subsidiary gas undertakings was 6%. The Directors feel that the prospects of continued expansion in the activities of the Association render it desirable to increase the authorized capital by the creation of 100,000 8% preference shares and 150,000 ordinary shares.

Danske Gaskompagni.

The quantity of gas sold during the year ended June 30 by the Danske Gaskompagni, whose headquarters are at Odense, Denmark, shows an increase of 2·03%, as compared with the sales of the preceding year. The accounts show a balance standing to the credit of Profit and Loss Account, after charging pensions, administration expenses, renewals account, &c., and transferring Kr. 254,883·52 to the redemption accounts, of Kr. 760,874·97. Out of this sum the Directors recommend that a dividend of 6%, or Kr. 8·10 per share, be declared. This will leave Kr. 505,725·97 to be carried forward—an increase of Kr. 74,871·42 on the amount brought in. Capital expenditure of Kr. 121,047·50 for additional mains, services, meters, &c., has been incurred during the year.

Darlington.

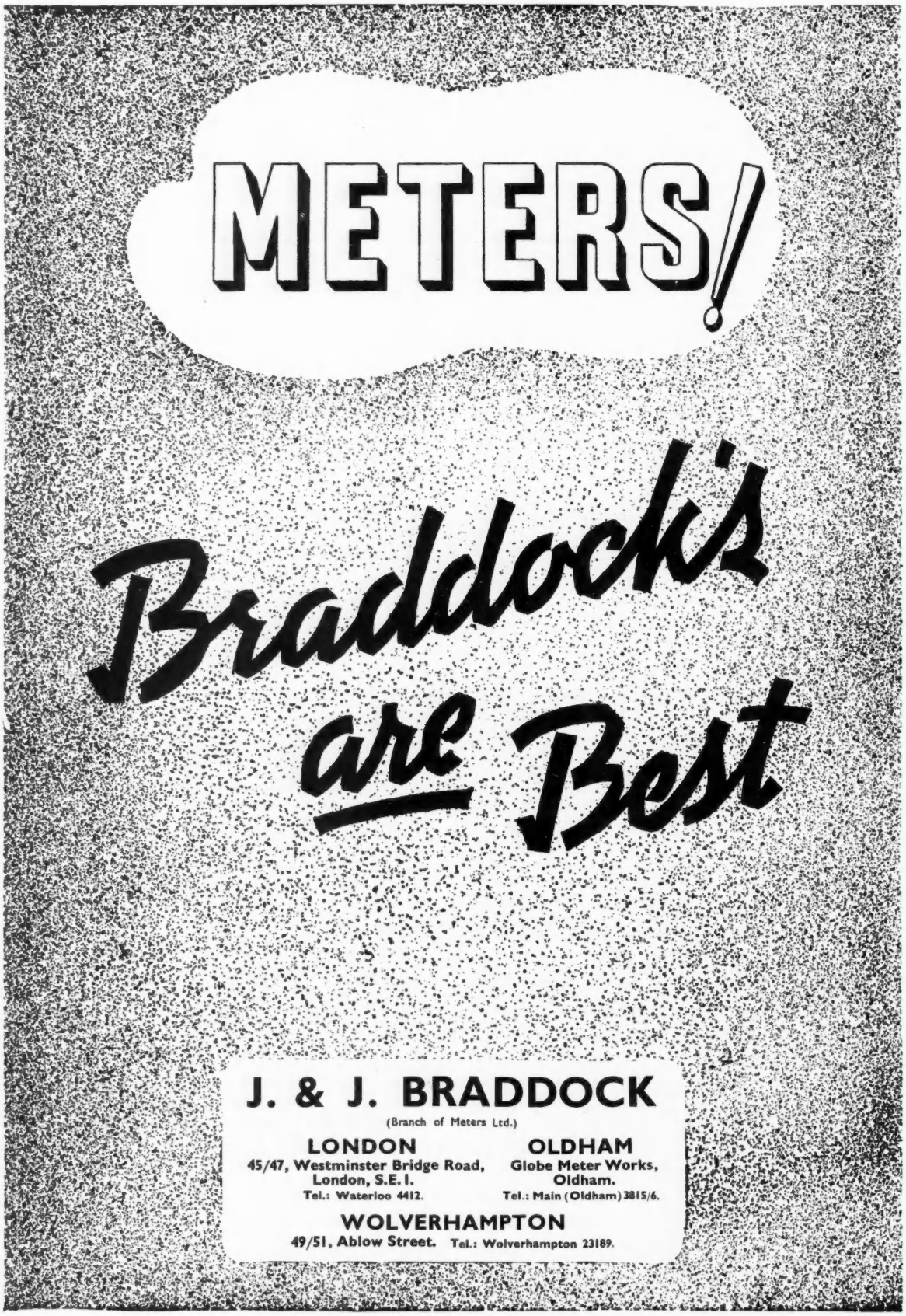
The gas-works accounts and statistics for the year to March of the County Borough of Darlington show that the quantity of gas sold was 645,647,812 cu.ft., as compared with 640,945,754 cu.ft. in the previous year. At the same time the percentage of gas unaccounted for was reduced somewhat. In the past twelve months the quantity of gas purchased totalled 525,307,000 cu.ft., as against only 40,721,000 cu.ft. in the comparable period. The proportion of gas sold for public lamps rose from 4·54% to 5·15%, and the number of lamps from 2,257 to 2,314. Of the 24,601 consumers at March last, 14,276 were users of prepayment meters. Out of the net amount charged to capital account of £334,352, there has been repaid £262,551, leaving only about £71,000 outstanding.

Dublin.

The report and accounts of the Alliance and Dublin Consumers' Gas Company are submitted by the Directors half-yearly, and those for the six months to June 30 show a profit on Revenue Account of £68,075. After providing for interest and adding the amount brought forward from the last accounts, the total available is £88,334. The Directors recommend the declaration of a dividend on the consolidated ordinary stock at the rate of 8% per annum, after payment of which a balance of £17,637 will remain to be carried forward. About £20,000 net has been added to the capital expenditure during the half-year, making the balance at debit of Capital Account £129,536. The gas sold totalled 7,056,237 therms, and of this quantity somewhat more than one-half was taken by prepayment consumers. Public lighting took 143,691 therms; there being 3,719 public lights.

Glasgow.

The Committee on Gas Supply, in their sixty-ninth annual report to the Corporation of the City of Glasgow, which covers the financial year to May 31, state that the balance carried to Profit and Loss Account amounts to £60,433, which compares with £167,596 for the previous year. As there was a reduction of only about £4,000 in the sums required for annuities, interest, and sinking fund, it follows that a surplus of £51,252 twelve months ago has been succeeded by a deficit of £52,324 on the past year's operations. The quantity of gas delivered and accounted for during the year under review amounted to 9,331,619,913 cu.ft., which was more than in the previous year by 40,349,034 cu.ft., or 0·434%. Of the 336,513 meters in use, 172,748 were ordinary and 163,765 prepayment. It is remarked that during the past winter great difficulty was experienced in obtaining coals under contract, and over the three months to Jan. 31 it was necessary to take 43,000 tons from stock. "Good quality coking coals have been frequently replaced by poorer qualities without any concession in price, resulting in lower thermal yields and higher percentage of fine breeze in coke. The Department's coal bill has been increased in four years by £168,939—4s. 8·212d. per ton—equal to an annual increase of 4·345d. per 1,000 cu.ft. of gas sold." In the course of the year a start was made systematically to lower prepayment meters to more suitable positions. The exchange of ordinary to prepayment meters, which was started some years ago, and which had to be regulated, steadily continues.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Leamington Spa.

The accounts of the Leamington Priors Gas Company are made up half-yearly, and, in submitting to the proprietors those for the period to June 30, the Directors state that the quantity of gas sold shows a satisfactory increase over the corresponding six months of 1937. Payment is recommended of the statutory maximum dividends, at the rates of 10% per annum on the Class "A" ordinary shares and of 7% per annum in the Classes "B" and "C" ordinary shares.

Milnathort.

The Milnathort Gaslight Company, Ltd., in their annual report, state that the quantity of gas consumed for the year was 19,424,000 cu.ft., being a decrease of 1,191,800 cu.ft., as compared with the previous year. The profit amounted to £902, and a dividend of 6%, free of income-tax, has been declared.

Stourbridge.

The quantity of gas sold during the year to March 31 by the Borough of Stourbridge Gas Department, as compared with the twelve months immediately preceding, showed an increase of 33,404,000 cu.ft., or over 8%. The total quantity of gas sold was 444,576,500 cu.ft., of which 262,185,000 cu.ft. was taken by ordinary consumers. The total borrowing powers exercised amount to £276,092, of which £187,651 has been redeemed, leaving an outstanding balance at March of £88,440. The division of the £3,583 17s. 5d. which represents the surplus on the past year's working is as follows, under the arrangement which is in force: General District Fund 75%, £2,687 18s. 1d.; Contingency Fund 25%, £895 19s. 4d. Thus it became necessary to transfer an amount of £12 1s. 11d. from the Equalization Fund in order to bring the contribution to the General District Fund to the agreed amount of £2,700. In view of the continued increase in the cost of all raw materials, it was found necessary to raise the price of gas from the beginning of the March quarter by 1½d. per 1,000 cu.ft. (on the sliding-scale).

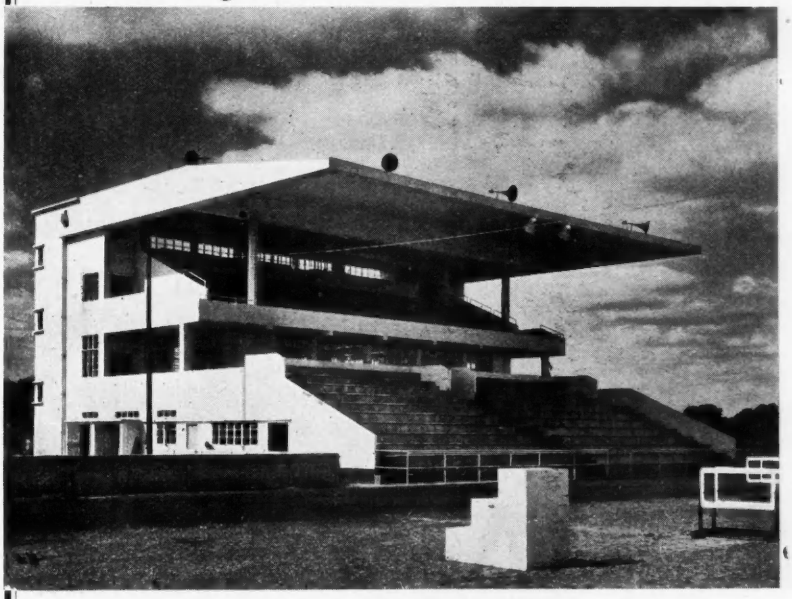
Stretford.

The report and statement of accounts of the Stretford and District Gas Board for the financial period to March 31 reveal an eminently satisfactory state of affairs. On the year there has been an increase in gas sales of 14·61%, which is all the more gratifying when account is taken of the fact that it follows upon a increase of 13·16% for the previous year. There has been an increase in the number of consumers of 1,565, or 5·08%. The total quantity of gas sold during the twelve months was 6,443,116 therms, and of this it is noteworthy that no less than 50·14% was for industrial purposes at special rates. For both ordinary and prepayment consumers there is an alternative two-part tariff, which was offered to domestic consumers as from October, 1934, and is being taken up by an increasing number of customers. At March last agreements had been completed by 7,247 consumers. The total amount of gas taken through ordinary and through prepayment meters was very nearly the same, though the ordinary consumers number 13,518 and the prepayment consumers 18,811. The average price realized for gas per therm sold was 5·95d. net; the rate for industrial consumers being 3·7d. On the financial side, there is a credit balance on Net Revenue Account for the year of £18,023. Of this amount £17,055 has been expended on capital works executed during the year for which loan sanctions were not utilized or applied for. As a matter of fact, the year has been one of particular activity internally for the Board and staff, the new work including a gasholder and a complete carbonizing plant, together with two new showrooms.

Welshpool.

The Directors of the Welshpool Gas Company, Ltd., in their annual report for the year ended June 30, 1938, state that the profit, after providing for depreciation of holders and meters, amounts to £670, to which must be added: Balance brought forward, £1,848, *less* final dividends for the year to June 30, 1937, of 3%, less tax, £270—£1,578, and hire-purchase interest £60—£2,309. From this sum must be deducted bank interest, income-tax, and interim dividend, £299, leaving a balance to credit of profit and loss account of £2,010. The Directors recommend that this amount be appropriated as follows: Final dividend for the year to June 30, 1938, 3%, less income-tax, making with the interim dividend 6%, less income-tax, for the year, £261, leaving a balance to carry forward to next year of £1,749—£2,010. The sale of gas for the financial year was 19,294,200 cu.ft., an increase over the previous year of 1,682,400 cu.ft., equal to 9·6%. At June 30, 1938, there were 324 ordinary consumers and 545 prepayment consumers on the books of the Company, a total of 869 and an increase of 18 during the year.

How Gas Serves a Modern Sports Pavilion



The Grand Stand of the Regent Street Polytechnic Stadium
(*Joseph Addison, F.R.I.B.A., Architect.*)

Gas is being used to an increasing extent for the provision of hot water for sports pavilions, where the service demanded is often of a somewhat special nature, and owing to its flexibility of action, it has proved itself easily the best fuel to cope with such situations.

At the new Grand Stand of the Regent Street Polytechnic at the Chiswick Stadium, "REX" and "EMPEROR" Automatic Gas Fired Heaters have been installed to supply the showers, hand basins, and a bathing pool, of which a descriptive leaflet will be sent on request.

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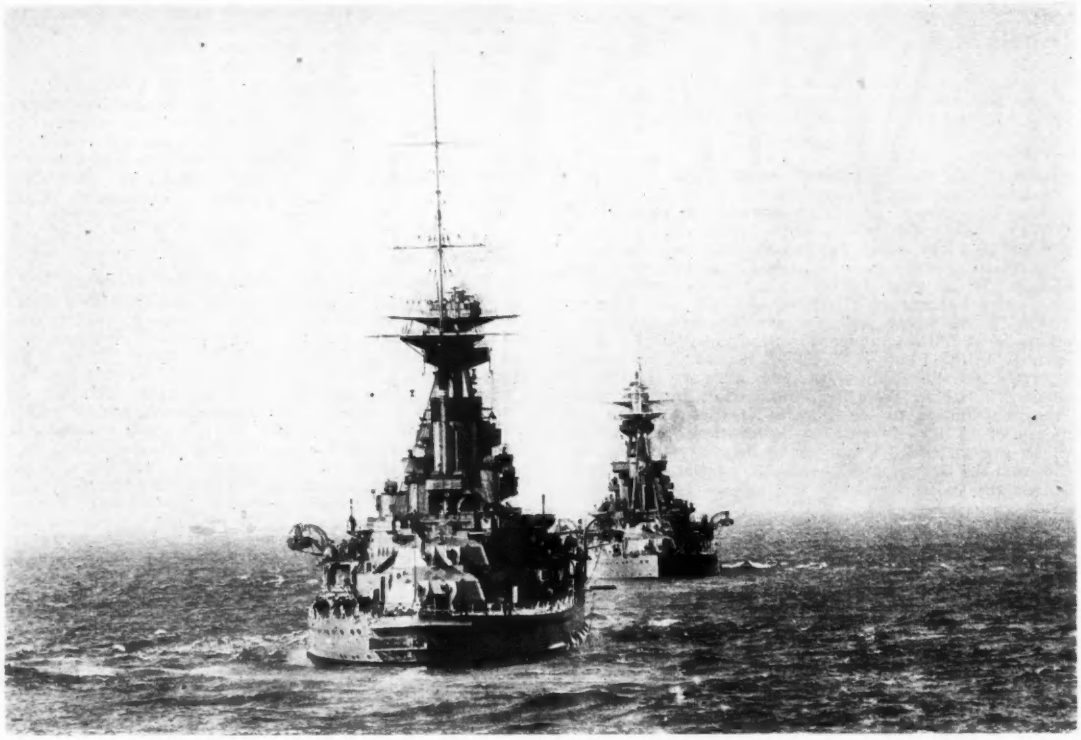

A Precautionary Measure.

The discomfort of a gas mask is our excuse for departing from the lighter vein this week. In the critical days through which we have just passed, the measure to mobilise the Fleet gave us a feeling of security.

As a good Precautionary Measure for the safeguarding of your gas sales at all times, we recommend the 'A. & M.' Meter.

ALDER & MACKAY LTD.

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Markets and Manufactures

Current Sales of Gas Products

The London Market

LONDON, *Oct.* 3.

To-day's values of Tar Products in the London market are as follows:

Pitch nominal at about 33s. per ton f.o.b.

Creosote, about 4½d.

Refined tar, 3¾d.

Pure toluole, about 2s. 3d.

Pure benzole, about 1s. 9d.

95/160 solvent naphtha, 1s. 7d. to 1s. 8d.

90/160 pyridine, 10s.

All per gallon naked at makers' works.

The Provinces

Oct. 3.

Crude Gas-Works Tar, 15s. to 20s.

To avoid misunderstanding, it is necessary to state that the above price is not claimed to represent a market value. It is a price worked out from week to week upon a system which has been used for many years as a basis for the fixing of certain contracts for crude tar of varying qualities in different areas.

The average prices of gas-works products during the week were: Pitch—East Coast, 31s. to 32s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 31s. to 32s.* Toluole, naked, North 1s. 7½d. to 1s. 9d. Coal tar, crude naphtha, in bulk, North, 7¾d. to 8¼d. Solvent naphtha, naked, North, 1s. 4½d. to 1s. 5d. Heavy naphtha, North, 1s. 3d. to 1s. 3½d. Creosote, *ex* works, in bulk, North, liquid and salty, 4⅛d. to 4¾d.; low gravity, 4¼d. to 4¾d. Carbolic acid, 60's, 1s. 9d. to 2s. Naphthalene, £13 10s. to £16. Salts, 70s. to 75s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal; "B" quality unsalable. Heavy oil: Unfiltered heavy tar oil, min. gr. 1,080, 4¾d. to 4⅞d.; filtered heavy tar oil, min. gr. 1,080 5⅛d. to 5¼d.; heavy tar oil, gr. less than 1,080, 4½d. to 4¾d.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Scotland

GLASGOW, *Oct.* 1.

Very little business was arranged during the week, but possibly the market will show some improvement from now onwards. Meantime prices remain easy.

Crude Gas-Works Tar.—Actual value is about 37s. to 38s. per ton *ex* works in bulk.

Pitch.—Supplies are plentiful with quotations round 23s. to 24s. per ton f.o.b. for export and about 21s. to 22s. per ton in bulk for home trade.

Refined tar.—Home controlled price is unchanged at 3¾d. to 4d. per gallon, while for export supplies can be obtained at round 3d. per gallon in buyers' packages at makers' works.

Creosote oil.—Market is not particularly active with prices as under: Specification oil, 4½d. to 4¾d. per gallon; low gravity, 5d. to 5¼d. per gallon; neutral oil, 4¾d. to 5d. per gallon; all *ex* works in bulk.

Cresylic acid.—Throughput is small and the following prices can only be taken as approximate: Pale, 97/99%, 1s. 4d. to 1s. 6d. per gallon; dark, 97/99%, 1s. 2d. to 1s. 4d. per gallon; and pale, 99/100%, 1s. 6d. to 1s. 10d. per gallon; all according to quality, *ex* works in buyers' packages.

Crude naphtha is commanding 5½d. to 6d. per gallon *ex* works in bulk, according to quality.

Solvent naphtha.—90/160 grade is offered at 1s. 3½d. to 1s. 4d. per gallon, and 90/190 heavy naphtha at 1s. 1d. to 1s. 1½d. per gallon.

Motor benzole is called 1s. 3d. to 1s. 4d. per gallon.

Pyridine.—Prices are nominal with 90/160 grade at 8s. to 9s. per gallon and 90/140 grade at 9s. to 10s. per gallon.

Benzole Prices

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole ..	0	9½	to 0	10		per gall. at works
Motor „ ..	1	3	„ 1	3½	„	„ „
90% „ ..	1	4	„ 1	4½	„	„ „
Pure „ ..	1	8	„ 1	8½	„	„ „

Contracts Advertised To-Day

Chlorination Plant.
Wallasey Gas and Water Department. [p. 70.]

C.I. Spun Pipes and Specials.
Sidmouth Gas Department. [p. 70.]

Cleaning and Painting Gasholder.
Blackpool Gas Department. [p. 70.]

Purifiers.
Abergavenny Gas Department. [p. 70.]

Dial Recording Thermometers

We have received a copy of "Modern Thermometry" which has been recently published by the British Rototherm Company, Ltd.

This brochure not only gives catalogue data, dimensions, specifications and prices of the various industrial and commercial Rototherm temperature gauges, but also sets forth the reasons, both mechanical, practical and economic, why the Bi-metallic Temperature Gauge is becoming each day more generally accepted by engineers as being very suited to modern requirements.

Improved Screens

A brochure dealing with various improved screens of the revolving, vibrating, and other types for screening and grading such materials as stone, ores, coal, slag, and other materials has been sent us by Messrs. Hadfields, Ltd. These screens are claimed to be carefully designed to give the maximum of efficiency and durability in service; the best materials and workmanship are employed in their construction; circular, hexagonal, and octagonal revolving screens of all sizes are supplied as well as vibrating and flat screens for fine materials.

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METROTECT

a bituminous paint producing a pleasant satin black finish with highly waterproof and anti-corrosive properties.

Protects steel-work which is continuously or periodically immersed in water. Does not become brittle on prolonged atmospheric exposure. METROTECT flows freely under the brush and can be applied quickly and without effort even in cold weather.

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GAS STOCKS AND SHARES

During the first three days of last week gloom and uncertainty prevailed in all sections of the Stock Exchange and the volume of business was severely restricted. Prices were marked down drastically to prevent panic selling and minimum prices introduced for gilt-edged stocks. The good news late on Thursday, however, brought in buyers with a rush and dealers, being short of supplies, were forced to put up prices in order to attract sellers in the hopes of meeting the heavy demands. Quotations in many instances closed the week at higher levels than those prevailing before the crisis. War Loan 3½%, for instance, finished at 99½ on Sept. 23, changed hands at 90 during last week, and closed on Friday at 102. After the week-end's reflection on the settlement it will be interesting to see how markets fare during the current week, but it is anticipated that some reaction will be inevitable.

Until the end of the week business in the Gas market was also practically at a standstill. Prices were marked down and wider margins quoted. On Friday, however, several good recoveries were recorded, and it will be seen in the list below that although many stocks have not wholly made up their losses, in several cases prices are now higher than a week ago. Gas Light units which at one time last week were changing hands at 16s. 6d. touched 24s. on Friday, and the quotation closed 1s. higher than a week ago at 23s. Imperial Continental dropped to 100 and finally reached 122, closing 7½ points higher at 120, while South Metropolitan was recorded as low as 90 and subsequently touched 107.

Quotations on the Provincial Exchanges did not receive the same drastic treatment as in London, while nominal quotations in the Supplementary List closed unchanged.

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Sept. 30	Rise or Fall on Week.
1,767,439	Sept. 5	8	8	Alliance & Dublin Ord. ...	132—142	...
374,000	June 20	4	4	Do. 4 p.c. Deb. ...	93—108	...
734,733	May 9	5	5	Asscd. Gas & Water U'd'ts Ord.	17/6—19/6	...
500,000	,,	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	19/—21/–	...
444,389	,,	§–/4	4	Do. 4 p.c. Red. Cum. Pref.	19/—20/–	...
296,523	,,	4	4	Do. 4 p.c. Irred. Cum. Pref.	16/—18/–	...
500,000	Sept. 5	3½	3½	Do. 3½ p.c. Red. Deb. ...	93—98	...
560,070	Aug. 22	7	7	Barnet Ord. 7 p.c.	157—162	...
300,000	Apl. 4	1/4½	1/9⅜	Bombay, Ltd.	24/6—26/6	...
180,435	Aug. 22	9½	9½	Bournemouth sliding scale ...	195—205	...
640,407	,,	7	7	Do. 7 p.c. max. ...	145—155	−9½
495,960	,,	6	6	Do. 6 p.c. Pref. ...	130—140	−1
50,000	June 20	3	3	Do. 3 p.c. Deb. ...	73—78	−5
312,025	,,	4	4	Do. 4 p.c. Deb. ...	95—100	−3
335,000	,,	5	5	Do. 5 p.c. Deb. ...	110—120	−2½
357,900	Aug. 8	7½	7½	Brighton, &c., 6 p.c. Con. ...	142—147	...
659,955	,,	6½	6½	Do. 5 p.c. Con. ...	126—131	...
205,500	,,	6	6	Do. 6 p.c. 'B' Pref.	120—125	−5
855,000	Sept. 19	8	7	British Ord.	136—141*	...
100,000	June 3	7	7	Do. 7 p.c. Pref.	140—145	...
350,000	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...
120,000	,,	4	4	Do. 4 p.c. Red. Deb. ...	90—95	−4
450,000	,,	5	5	Do. 5 p.c. Red. Deb. ...	100—105	−2
450,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	−4
100,000	22 May'33	6	4	Cape Town, Ltd.	1—2	...
100,000	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1⅛—3⅛	...
150,000	June 20	4½	4½	Do. 4½ p.c. Deb. ...	60—70	...
626,860	July 18	6	6	Cardiff Con. Ord.	118—123	...
237,860	June 3	5	5	Do. 5 p.c. Red. Deb.	105—110	...
98,936	Sept. 19	2/–	2/–	Colombo Ord....	1⅛—1⅜*	...
24,510	,,	1/4⅜	1/4⅜	Do. 7 p.c. Pref.... ...	22/6—24/6*	...
739,453	Mar. 21	–/11·48	–/11·48	Colonial Gas Assn. Ltd. Ord.	16/6—18/6	...
296,144	,,	1/3·30	1/3·30	Do. 8 p.c. Pref. ...	23/—25/–	...
1,775,005	Aug. 8	5	5	Commercial Ord.	79—84	...
140,000	,,	—	§13/4	Do. 4 p.c. Red. Pref.	95—100	−1
620,000	June 3	3	3	Do. 3 p.c. Deb. ...	70—75	−2
286,344	Aug. 22	5	5	Do. 5 p.c. Deb. ...	110—120	−½
200,000	,,	—	§30/2	Do. 3½ p.c. Red. Deb.	95—100	−3
807,560	Aug. 8	7	7	Croydon sliding scale ...	135—140	...
644,590	,,	5	5	Do. max. div. ...	98—103	−7
620,385	June 20	5	5	Do. 5 p.c. Deb. ...	110—120	−2½
239,000	Aug. 8	5	5	East Hull Ord. 5 p.c.	94—99	...
186,155	Aug. 8	6	6	East Surrey Ord. 5 p.c. ...	116—121	...
176,211	June 3	5	5	Do. 5 p.c. Deb. ...	108—118	−4½
250,000	July 4	4	8	Gas Consolidation Ord. 'B' ...	19/—21/–	−2/6
250,000	May 9	4	4	Do. 4 p.c. Red. Cum. Pref.	17/6—19/6	...
9,223,324	Aug. 8	5⅔	5⅔	Gas Light & Coke Ord. ...	22/—24/–*a*	+1/–
2,600,000	,,	3½	3½	Do. 3½ p.c. max. ...	70—80	−5
4,477,106	,,	4	4	Do. 4 p.c. Con. Pref....	95—100	−2½
2,993,000	July 4	—	3½	Do. 3½ p.c. Red. Pref....	95—100	−4
8,602,497	May 23	3	3	Do. 3 p.c. Con. Deb....	75—78	−3
3,642,770	,,	5	5	Do. 5 p.c. Red. Deb....	110—115	+1
3,500,000	,,	4½	4½	Do. 4½ p.c. Red. Deb....	107—112	−1
700,000	Sept. 5	3½	3½	Do. 3½ p.c. Red. Deb....	90—95	−5
270,466	Aug. 22	6	6	Harrogate New Cons. ...	117—122	...
157,500	Mar. 21	1/2½	‡1/–	Hong Kong and China Ord....	⅝—1	...
213,200	Aug. 8	6	5⅝	Hornsey Con. 3½ p.c ...	97—102	...
5,600,000	May 9	8	12	Imperial Continental Cap ...	115—125	+7½
223,130	July 18	3½	3½	Do. 3½ p.c. Red. Deb....	87—92	...
235,242	Aug. 8	8½	8½	Lea Bridge 5 p.c. Ord. ...	164—169	...
11,751	Aug. 22	10	8	Maidstone 5 p.c. Cap. ...	175—185	...
63,480	June 20	3	3	Do. 3 p.c. Deb.... ...	70—75	...
45,000	May 23	†10	†10	Malta & Mediterranean ...	135—140	...
				Metropolitan (of Melbourne)		
392,000	Apl. 1	5½	5½	5½ p.c Red. Deb.	99—102	...
231,977	Aug. 22	5	5	M.S. Utility 'C' Cons. ...	99—104	...
968,658	,,	4	4	Do. 4 p.c. Cons. Pref.	93—98	−2
390,076	June 20	4	4	M.S. Utility 4 p.c. Deb. ...	95—100	−2
148,955	,,	5	5	Do. 5 p.c. Deb. ...	113—118	...
675,000	May 9	†6	†6	Montevideo, Ltd.	73—78	...
250,000	Aug. 8	7½	7½	North Middlesex 6 p.c. Con.	142—147	...
396,160	Aug. 8	5	5	Northampton 5 p.c. max. ...	105—110	...
300,000	Apl. 25	†9	†7	Oriental, Ltd.	147—152	...
468,537	June 3	8	8	Plymouth & Stonehouse 5 p.c.	140—150	−7½
621,667	Aug. 8	8½	8½	Portsmouth & Gosport Cons.	157—162	...
241,446	,,	5	5	Do. 5 p.c. max. ...	100—105	...
73,350	,,	5	5	Do. 5 p.c. Pref. ...	107—112	...
75,000	,,	4	4	Do. 4 p.c. Pref. ...	90—95	−4
114,000	Aug. 8	5	5	Preston 5 p.c. Pref.	105—110	+1
247,966	June 3	4	4	Primitiva 4 p.c. Cons. Deb. ...	98—103	...
625,959	July 18	4	4	Do. 4 p.c. Red. Deb. ...	94—99	...
15,000	Sept. 5	6	6	San Paulo 6 p.c. Cum. Pref. ...	8½—9*	...
441,275	Sept. 19	1/1⅛	1/1⅛	Severn Val. Gas Cor. Ld. Ord.	20/6—22/6*	...
460,810	Sept. 19	–/10⅝	–/10⅝	,, ,, 4½ p.c. Cum. Pref.	19/6—21/6*	...
133,201	Aug. 22	5	8⅛	Shrewsbury 5 p.c. Ord. ...	127—132	...
9,000	June 3	4	‡4	South African Ord.	4½—5½	...
1,371,752	Aug. 22	1/2⅛	1/2⅛	South East'n Gas Cn. Ld. Ord.	21/—23/–	...
871,636	,,	–/10⅝	–/10⅝	Do. 4½ p.c. Red. Cum. Pref.	20/—22/–	...
498,818	,,	4	4	Do. 4 p.c. Cum. Pref. ...	18/—20/–	...
450,000	Aug. 8	4	4	Do. 4 p.c. Deb.	99—102	...
150,000	,,	3⅛	3⅛	Do. 3½ p.c. Red. Deb. ...	94—97	...
6,709,895	Aug. 8	6	5	South Met. Ord.	102—107	...
1,135,812	,,	6	6	Do. 6 p.c. Irred. Pref. ...	125—130	−3
850,000	,,	4	4	Do. 4 p.c. Irred. Pref. ...	95—100	...
1,895,445	June 20	3	3	Do. 3 p.c. Deb.	74—79	−2½
1,000,000	July 4	5	5	Do. 5 p.c. Red. Deb. ...	105—110	−4
600,000	,,	—	§31/–	Do. 3½ p.c. Red. Deb. ...	93—98	−5
1,543,795	Aug. 8	6	6	South Suburban Ord. 5 p.c. ...	110—120	−2½
512,825	,,	5	5	Do. 5 p.c. Pref.... ...	108—113	...
500,000	,,	4	4	Do. 4 p.c. Pref.... ...	95—100	...
250,000	,,	3½	3½	Do. 3½ p.c. Red. Pref. ...	90—95	−6
888,587	June 3	5	5	Do. 5 p.c. Deb.	113—118	−2
250,000	,,	4	4	Do. 4 p.c. Deb.... ...	95—100	−1
200,000	Aug. 8	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	−3
427,859	Sept. 19	8½	9½	S. Western Gas & Water Ord.	16/—18/–*	...
160,523	,,	–/10⅛	–/10⅛	Do. 4½ p.c. Red. Cum. Pf.	19/—21/–	...
110,000	June 3	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
750,541	Aug. 8	5½	5	Southampton Ord. 5 p.c. ...	105—110	...
148,836	June 3	4	4	Do. 4 p.c. Deb.	95—100	...
350,000	Aug. 8	5½	5½	Swansea 5½ p.c. Red. Pref. ...	105—110	−1
200,000	June 3	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...
1,076,490	Aug. 8	6⅔	6⅔	Tottenham and District Ord.	125—130	1
409,835	,,	5½	5½	Do. 5½ p.c. Pref. ...	115—120	−2
62,235	,,	5	5	Do. 5 p.c. Pref. ...	108—113	−2
334,615	June 3	4	4	Do. 4 p.c. Deb. ...	95—100	−1
85,701	Apl. 25	6	6	Tuscan 6 p.c. Red. Deb. ...	95—101	...
1,131,550	Aug. 22	6	4	U. Kingdom Gas Cor. Ord. ...	17/—20/–	—/6
1,051,280	May 9	4½	4½	Do. 4½ p.c. 1st Cum. Pref.	19/—21/–	...
762,241	,,	–/1·15	4	Do. 4 p.c. 1st Red. Cum. Pf.	19/—21/–	...
745,263	June 3	4½	4½	Do. 4½ p.c. 2nd Non-Cum.Pf.	16/—18/–	...
1,000,000	Sept. 5	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—98	...
375,689	Aug. 8	7	7	Uxbridge, &c., 5 p.c.	120—130	−9½
133,010	,,	5	5	Do. 5 p.c. Pref. ...	108—113	...
1,371,138	Aug. 8	7	7	Wandsworth Consolidated ...	135—140	...
2,525,768	,,	4	4	Do. 4 p.c. Pref. ...	95—100	−2
1,343,964	June 3	5	5	Do. 5 p.c. Deb. ...	113—118	−2
383,745	,,	4	4	Do. 4 p.c. Deb. ...	95—100	−2
400,000	,,	—	§25/–	Do. 3½ p.c. Red Deb.	95—100	−2
558,342	Aug.	7	6⅔	Watford and St. Albans Ord.	125—130	−8
200,000	,,	5	5	Do. 5 p.c. Pref. ...	105—110	−3
200,000	,,	5½	5½	Do. 5½ p.c. Pref. ...	110—115	−8
200,000	,,	—	16/8§	Do. 4 p.c. Red. Pref.	95—100	−5
200,000	June 3	4	4	Do. 4 p.c. Red. Deb.	96—101	...
200,000	,,	3½	3½	Do. 3½ p.c. Red Deb.	90—95	−4

a.—The quotation is per £1 of stock. * Ex. div. † Paid free of income-tax. ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Cont.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Nominal Quotations Sept. 30.	Rise or Fall on Week.
202,152	Sept. 5	5	5	Ascot Ord.	101—106	...
128,182	July 18	5	5	Do. 5 p.c. Pref.	108—113	...
31,035	Aug. 22	-/4½	-/4½	Associated Utilities 4 p.c. Pref.	16/—18/-	...
100,000	Dec. 13	...	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...
17,000	Aug. 22	8	8	Bognor Orig. Ord. 'A' ...	155—165	...
62,210	,,	8	8	Do. New Addl. 'A' ...	155—165	...
87,160	,,	7	7	Do. New 7 p.c. max. ...	145—155	...
37,440	Aug. 8	10	10	Cam. Univ. & Town 10 p.c. max.	188—198	...
125,970	,,	7	7	Do. 7 p.c. max.	133—138	...
39,025	,,	5	5	Do. 5 p.c. max.	97—102	...
96,410	July 18	4½	4½	Cardiff 4½ p.c. Pref.	95—100	...
150,000	Aug. 8	4	4	Croydon 4 p.c. Pref.	97—100	...
130,000	June 20	4	4	Do. 4 p.c. Deb.	97—102	...
65,000	Aug. 8	8½	7½	Eastbourne 'A' 5 p.c. ...	140—145	...
198,000	,,	7	6	Do. 'B' 3½ p.c.	115—120	...
112,312	,,	5	5	Do. 5 p.c. Pref.	107—112	...
130,000	June 20	5	5	Do. 5 p.c. Deb.	112—117	...
24,000	Aug. 8	8½	8½	Great Yarmouth 8½ p.c. max.	43—48	...
59,400	,,	7½	7½	Do. 7½ p.c. max.	33—38	...
51,160	June 3	5½	5½	Do. 5½ p.c. Deb.	121—126	...
152,600	Sept. 5	9	8	Guildford Cons.	163—168	...
54,055	,,	5	5	Do. 5 p.c. Pref.	107—112	...
68,250	June 3	5	5	Do. 5 p.c. Deb.	107—112	...
156,600	Aug. 22	7½	7½	Hampton Court Cons. ...	131—136	...
80,000	Aug. 8	4	4	Lea Bridge 4 p.c. Pref. ...	94—99	...
60,000	,,	6	6	Do. 6 p.c. Pref.	121—126	...
94,876	June 3	4	4	Do. 4 p.c. Deb.	95—100	...
73,620	Sept. 5	8½	8½	Luton Cons. 'A'	153—163	...
107,960	Sept. 19	5½	4	Mid Kent Ord.	8½—9½	...
230,940	Aug. 8	10	10	Oxford & District Ord. ...	195—200	...
47,112	,,	5	5	Do. 5 p.c. Pref.	106—111	...
50,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	107—112	...
126,193	May 9	7½	7½	Peterborough Ord.	135—145	...
64,990	Sept. 5	6½	7½	Redditch Ord....	118—128	...
166,850	Aug. 8	8	8	Romford Ord....	142—147	...
60,000	,,	4	4	Do. 4 p.c. Pref.	97—100	...
44,000	Sept. 19	5	5	Do. 5 p.c. Deb.	112—117*	...
25,570	Aug. 8	5½	5½	Rugby 5½ p.c. Pref.	120—125	...
25,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	104—109	...
42,750	June 3	5½	5½	Do. 5½ p.c. Deb.	118—123	...
110,950	Aug. 22	8	8	Ryde Ord.	140—150	...
270,086	Sept 5	7	7	Slough Ord.	128—133	...
21,000	June 20	5	5	Do. 5 p.c. Deb.	110—115	...
28,872	May 9	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	19/—21/-	...
28,866	Sept. 5	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	18/—20/-	...
117,228	Aug. 8	7	5	Swindon Cons.	102—107	...
60,425	June 3	5	5	Do. 5 p.c. Deb.	112—117	...
64,380	June 3	5	5	Torquay & Paignton 5 p.c. Pref.	107—112	...
130,000	Aug. 8	8	5	Wakefield Ord.	116—121	...
81,650	,,	5	5	Do. 5 p.c. max.	100—105	...
82,000	Aug. 8	6	6	Weymouth Ord.	103—108	...
98,384	Aug. 22	6	6	Wolverhampton 6 p.c. Pref.	118—123	...
160,000	June 20	5½	5½	Do. 5½ p.c.Rd.Db.	105—110	...
90,000	June 20	5	5	York 5 p.c. Red. Deb. ...	104—109	...
133,640	July 18	6½	6½	Yorktown (Cam.) 5 p.c. Cons.	118—123	...
120,000	,,	5	5	Do. 5 p.c. Pref.	105—110	...
35,000	June 3	5½	5½	Do. 5½ p.c. Deb.	120—125	...

BRISTOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Sept. 30.	Rise or Fall on Week.
347,756	July 18	6	5	Bath Cons.	118—120	...
1,667,250	July 18	5	5	Bristol, 5 p.c. max.	110—112	—
120,420	June 3	4	4	Do. 1st 4 p.c. Deb. ...	99—101	...
217,870	,,	4	4	Do. 2nd 4 p.c. Deb. ...	99—101	...
328,790	,,	5	5	Do. 5 p.c. Deb.	119—122	...
274,000	Aug. 8	5	5	Newport (Mon). 5 p.c. max....	97—99	...
13,200	Sept. 19	8⅝	7	Pontyp'l Gas & W. 10 p.c. "A"	12¾—13¾*	...
13,600	,,	6	5	Do. 7 p.c. 'B'	11⅛—12½*	...
40,000	,,	6	5	Do. 7 p.c. 'C'	11⅛—12½*	...
140,778	Aug. 8	5	5	Weston-super-Mare Cons. ...	108—110	...
64,338	June 20	4	4	Do. 4 p.c. Deb.	100—102	...
33,340	,,	7½	7½	Do. 7½ p.c. Deb.	151—154	...

LIVERPOOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Sept. 30.	Rise or Fall on Week.
157,150	Aug. 8	6½	5	Chester 5 p.c. Ord.	109—111	...
92,500	June 20	4	4	Do. 4 p.c. Pref.	95—99	...
36,430	,,	3½	3½	Do. 3½ p.c. Deb.	87—90	...
41,890	,,	4	4	Do. 4 p.c. Red. Deb. ...	97—101	...
2,167,410	Aug. 22	6	6	Liverpool 5 p.c. Ord.... ...	120—122	—1
245,500	June 20	5	5	Do. 5 p.c. Red. Pref. ...	97—102	...
306,083	July 18	4	4	Do. 4 p.c. Deb.... ...	100—102	...
106,280	Aug. 8	10	10	Preston 'A' 10 p.c.	198—208	...
188,219	,,	7	7	Do. 'B' 7 p.c.	131—141	...

NEWCASTLE EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Sept. 30.	Rise or Fall on Week.
122,577	Aug. 8	8	8	Blyth 5 p.c. Ord.	161—162	...
732,000	Aug. 22	5	5	Hartlepool G. & W. Cn. & New	94—95	...
2,061,315	Aug. 8	5½	5	Newcastle & Gateshead Con.	22/6-23/-a	...
682,856	,,	4	4	Do. 4 p.c. Pref. ...	99—100	...
776,706	June 20	3½	3½	Do. 3½ p.c. Deb. ...	88½—89½	...
277,285	May 9	5	5	Do. 5 p.c. Deb. '43 ...	103¼—105¼	—¾
332,351	Aug. 22	6	6	Sunderland 6 p.c. max. ...	135—136	...

NOTTINGHAM EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Sept. 30.	Rise or Fall on Week.
542,270	Aug. 8	9	6	Derby Con.	133—143	...
55,000	June 3	4	4	Do. 4 p.c. Deb. ...	100—105	...
20,000	June 20	5	5	Long Eaton 5 p.c. Pref. ...	10—12	...
80,000	,,	5	5	Do. 5 p.c. Deb. ...	105—110	...

SHEFFIELD EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Sept. 30.	Rise or Fall on Week.
10,000	Aug. 8	10	10	Great Grimsby 'A' Ord. ...	205—215	...
6,500	,,	10	10	Do. 'B' Ord. ...	205—215	...
79,000	,,	10	10	Do. 'C' Ord. ...	195—205	...
1,806,339	Aug. 22	6½	6½	Sheffield Cons.	139—141	...
95,000	July 4	4	4	Do. 4 p.c. Deb. ...	101—103	...

a The quotation is per £1 of Stock. * Ex div.

PUBLISHERS' NOTICE

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